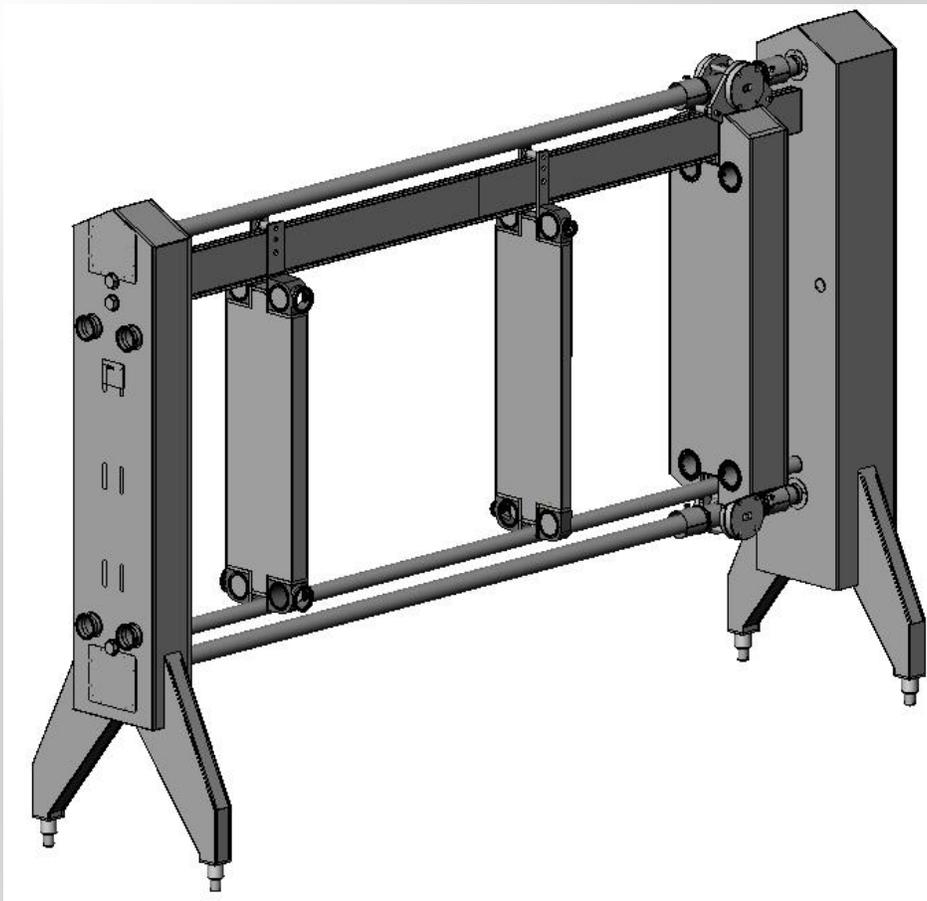




# AGC AR51-D

## Operation and Maintenance Manual



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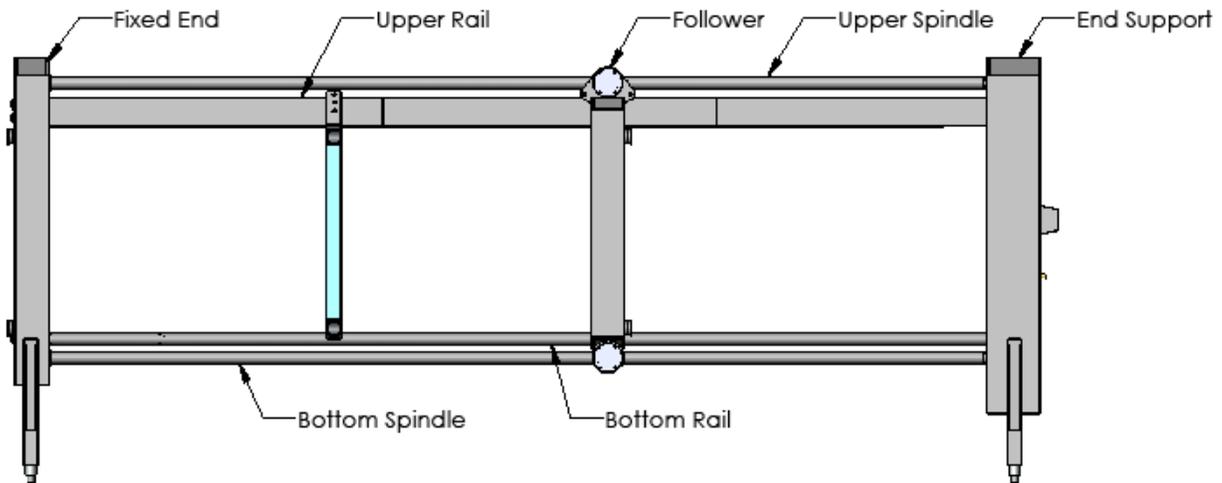


## **Scope:**

This manual is intended to be a supplement to the **AGC Heat Transfer Proflow Operation Manual**. The information provided here is for the normal operation and installation of the AGC Model AR51-D Plate Heat Exchanger. Please read and follow all safety instructions contained in this manual. Failure to follow all safety recommendations could result in serious injury to the operator or cause damage to the press. If you need additional information or spare parts for this or any other equipment built by AGC please contact your local AGC distributor.

## **Receiving and Inspection:**

Each AGC frame is assembled and fully tested at the factory prior to shipping. After testing, the unit is prepared for shipping. When the press leaves the factory it is in perfect condition. Upon arrival, carefully inspect the frame for any damage that may have occurred during shipping. If the frame was damaged during shipping report this to AGC immediately. In most cases the frame is shipped assembled with the plates in a separate crate. Because each frame can weigh over 10,000 pounds, only qualified and licensed forklift truck drivers should lift and position the frame. If your frame was shipped disassembled refer to the assembly instructions section of this manual for assembly procedures. Figure 1 shows the major frame components. Depending on the application, your frame may or may not be equipped with one or more terminals.

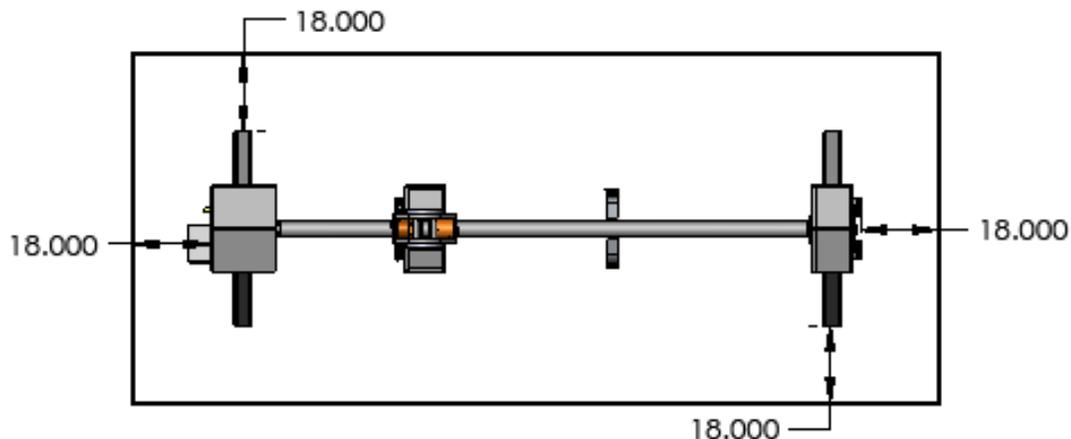


**Figure 1**  
**Major Frame Components**

Locate the drawing package that was shipped with your frame. This drawing package contains important information specific to your frame. If your frame was delivered without a drawing package, contact AGC or your local AGC distributor for a replacement package prior to installing the frame.

## **Frame Placement:**

The AR51-D frame should be located on a firm flat surface capable of supporting the press and all of its contents when full. Ensure that adequate space is left around the frame for maintenance and plate installation/removal. A recommended clearance of 18" between the outer edges of the heat exchanger and the wall or other facility equipment will allow a Pro5 series heat exchanger plate to be easily tilted in or out of the press. The space at each end of the press will allow the spindles to be removed for maintenance or replacement of the spindle or spindle drive nuts.



**Figure 2**  
**Top View Showing Recommended Clearance**

Each frame is equipped with adjustable ball feet to compensate for minor floor variations. To adjust the ball foot height, turn the base of the foot clockwise to raise and counterclockwise to lower. **CAUTION:** Never exceed the maximum port height dimension shown on the streaming diagram. If this dimension is exceeded, the leg could disengage from the socket and the frame could tip.

When moving the frame, the top rail can provide a good lifting point. When using the top rail as a lifting point, exercise caution to prevent damaging the plate hanger. Do not attempt to lift a frame using the spindle screws as a lifting point. Lifting a frame by the spindle screws could render the frame inoperable and require replacing the spindles. Moving a frame that is fully populated with plates is not recommended.

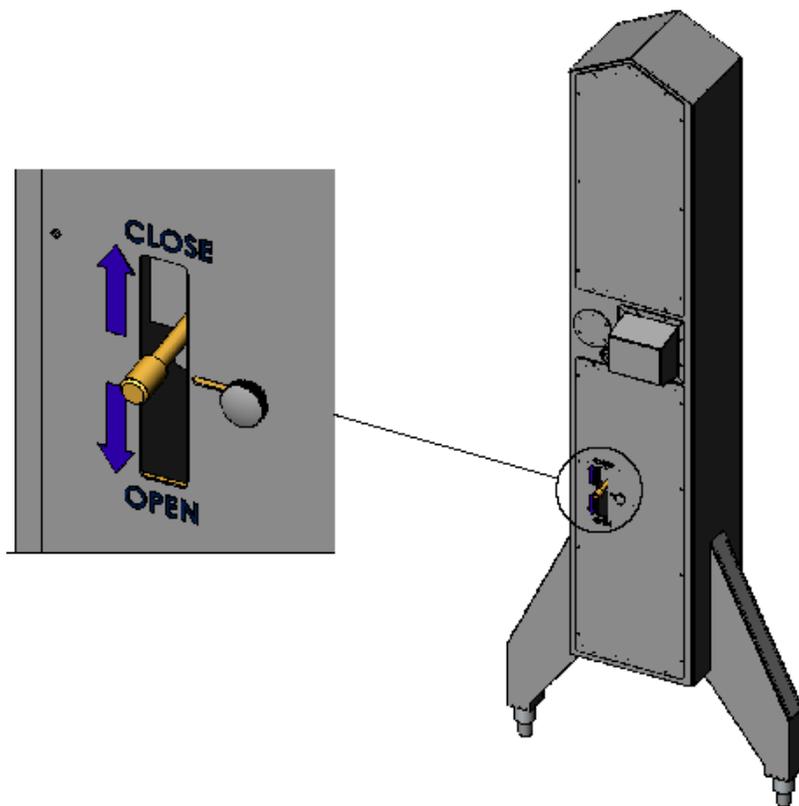
## **Normal Operation:**

The AGC Model AR51-D heat exchanger is designed to make the opening and closing process fast and easy. As with all plate heat exchangers, the unit must be cooled below 90°F and relieved of all internal pressure before opening. **Failure to follow this safety warning could result in serious injury to the operator or damage to the plates and/or plate gaskets.**

The hydraulic end support uses an electric motor to drive the hydraulic pump. The hydraulic system is used only when opening or closing the frame and should not be operated when the press is processing product, during the cleaning cycle (CIP), or any other time fluids are being circulated through the plate pack.

Opening or closing the press is done by using the open/close valve, which is accessible through a splashguard located on the back of the end support (see figure 3). This is a three-position (open/neutral/close) valve equipped with detents that will hold the valve either open or closed for

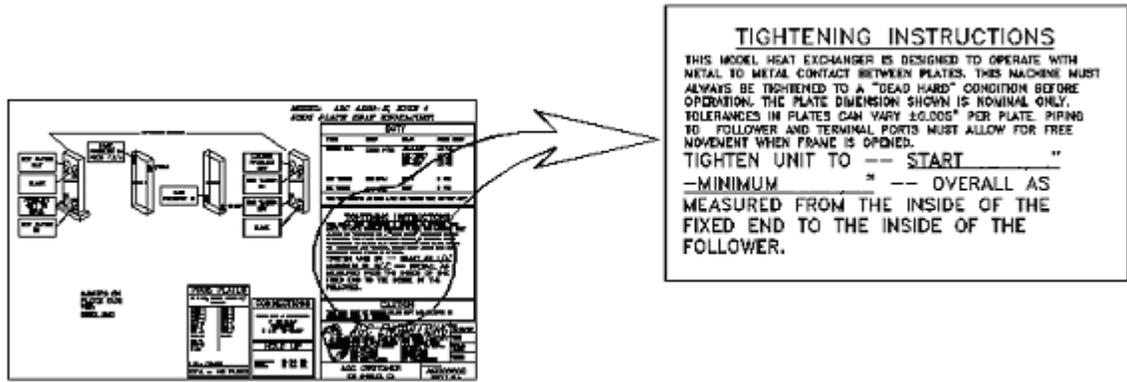
a majority of the closing or opening process. This valve also provides the main system pressure relief. The relief has been set at the factory to close the press to the “dead-hard” condition when the valve is held in the closed position. When the plates are new it is permissible to operate the unit at or below the start dimension but never below the minimum dimension listed on the streaming diagram. After years of service, and depending on the typical operating pressure seen by the plate pack, the contact points on the plates may begin to show normal wear. If this condition exists you may find the hydraulic system will tighten the unit below the originally installed dimension. This is normal and not cause for concern.



**Figure 3**  
**Open/Close Lever**

### **Closing the Frame:**

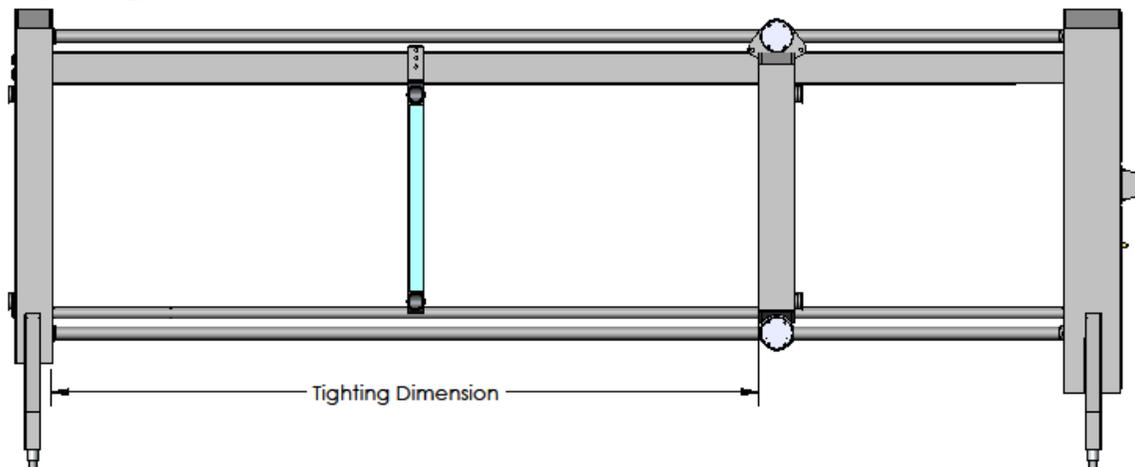
After all the plates and any terminals are installed into the press it can be closed. Refer to the streaming diagram that was provided with the heat exchanger to determine the proper plate configuration and piping requirements. The AR51-D will provide enough closing power to compress the plate pack to the factory recommended minimum or “dead-hard” dimension. The press is equipped with a pressure gauge that provides information on how much pressure is being developed in the system as the plate pack compresses. This pressure is associated with the amount of resistance the plates are providing to the spindle screws. The streaming diagram will have a start dimension and a minimum dimension. Figure 4 shows where this information is listed on the drawing. Note: The dimensions for each frame will be listed on the streaming diagram shipped with that frame.



**Figure 4**  
**Streaming Diagram Sample**

To close the frame, apply power to the hydraulic power unit. Before closing the press the operator should make sure all pipes and lines are clear and the plates are in the correct arrangement per the drawing. Move the open/close lever to the upper locked position. This lock or detent will hold the valve in position until the frame is approximately one to two inches from the start dimension. If this is the first time closing a new press or the first closure after installing new plates the compressed dimension should be observed and compared to that shown on the drawing. Hold the handle in the closed position until the unit stalls. After the unit stalls you will be at the “dead-hard” dimension, which is between the start and minimum dimension for a new unit. You are now ready for operation. It should also be noted that as the plates compress, it is normal for the plate pack to make crackling noises. This is caused by the plates sliding along the support rail and is not a cause for alarm. After the hydraulic unit has stopped closing (stalled) disconnect power to the unit and make a note of the actual “dead-hard” dimension as shown in figure 4. If this dimension is below the minimum and the number of plates installed is consistent with the drawing, you should consider purchasing a new plate pack or obtain a professional opinion from one of our factory engineers as to the actual condition of the plates.

Installation of new gaskets and/or plates is recommended if external leakage is observed when operating at the minimum dimension.



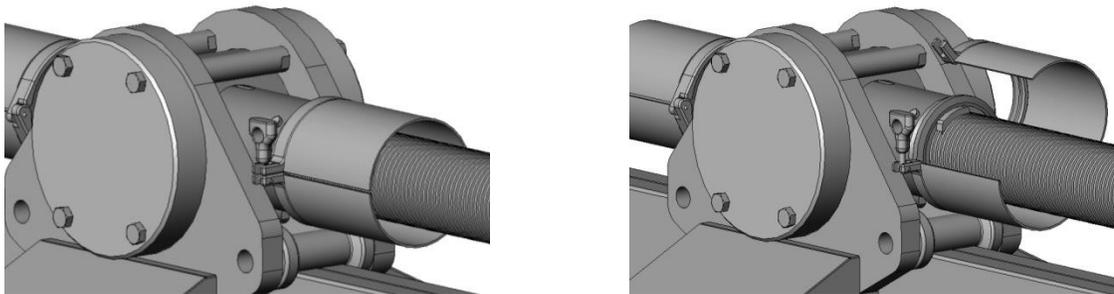
**Figure 5**  
**Tightening Dimension**

The heat exchanger should be pressure tested to check for leaks. If the pressure check passes, the frame is ready to be put into service.

## **Opening the Frame:**

Prior to disconnecting any piping ensure the heat exchanger is cooled below 90°F and relieved of all internal pressure. Once these conditions are met the press is safe to open. Begin the opening operation by removing all connections from the follower and from any terminals that may be installed. Next apply power to the hydraulic power unit. Access the open/close lever (see figure 3) and move it to the lower locked position. As the press opens, the follower will retract toward the end support. Note: The follower can be retracted all the way to the end support, but it should not be allowed to contact the end support. Contact between the follower and the end support could result in damage to either or both components.

The follower has been designed with a lubricating system that applies grease to the spindle screws automatically every time the press is opened or closed. This system was designed with special scrapers that ensure most of the grease stays inside the grease reservoir as the follower travels along the screws. These scrapers will also prevent dirt and debris from entering the spindle drive nut during operation. As the scrapers clean the screw threads the debris (if any) will be collect in special catch trays fitted to the follower. To clean out the catch tray carefully remove the cover by opening the clamp bolt as shown in figure 6.

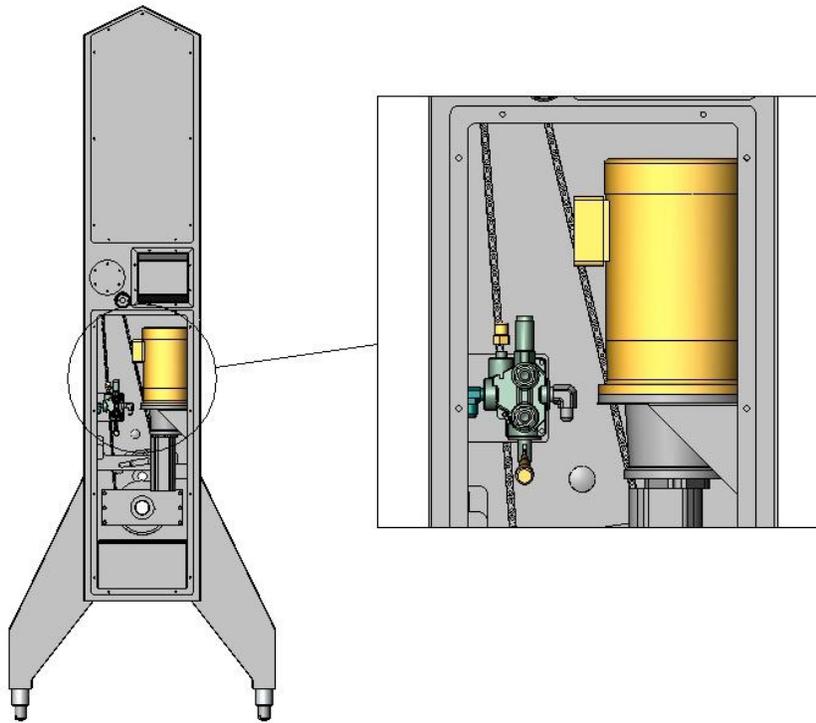


**Figure 6**

Once any accumulation is cleaned the trays can be re-installed.

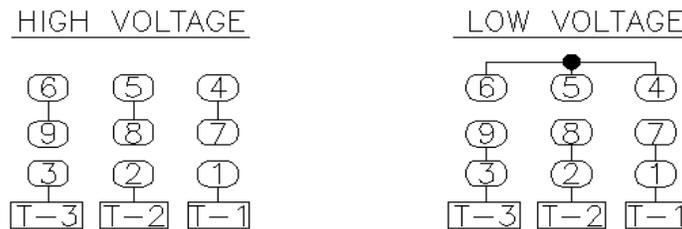
## **Electrical Connections:**

Only a qualified electrician following all applicable local regulations should make the electrical connections to the motor. The motor is located in the end support and is accessed by removing the bottom cover. A conduit is connected from the motor to a connection port on the right side of the end support. The connection port has 3/4" internal pipe threads. The electrical motor is a 230/460V 3 phase 10 horsepower NEMA 215TC frame unit.



**Figure 7**  
**Motor Pump Assembly**

The electrical motor is connected to a two stage pump. The pump is set at the factory to run in a clockwise rotation. Check to ensure the reservoir is full prior to testing the motor rotation. Never run the gear pump dry. Figure 8 shows the wiring diagram for the electric motor.



**Figure 8**  
**Wiring Diagram**

If the rotation of the motor is incorrect, the pump will not produce pressure and the system will not operate. To reverse the rotation of the motor, swap T-2 and T-3 at the motor.

### **Hydraulic System:**

After the electric motor is connected, the hydraulic power unit and associated components can be tested/verified. The AR51-D hydraulic power unit is capable of producing a maximum of 3500 psi. This maximum pressure is regulated down using a pressure-regulating valve. This valve is pre-set at the factory to match the system requirements for closing a new plate pack. As the plates and gaskets age it may be necessary to adjust the hydraulic system pressure. To adjust the pressure follow the procedure described in the Operator Maintenance section of this manual.

Typically, the press is shipped from the factory with a full reservoir. However, if the press is shipped disassembled, the oil will be shipped in a separate container. Prior to testing the motor, ensure the hydraulic reservoir is full. The tank capacity is approximately 8 gallons and should be run full. To check the oil, remove the breather cap. The cap is fitted with a dipstick. The oil level should be visible on the stick near the full indicator line.

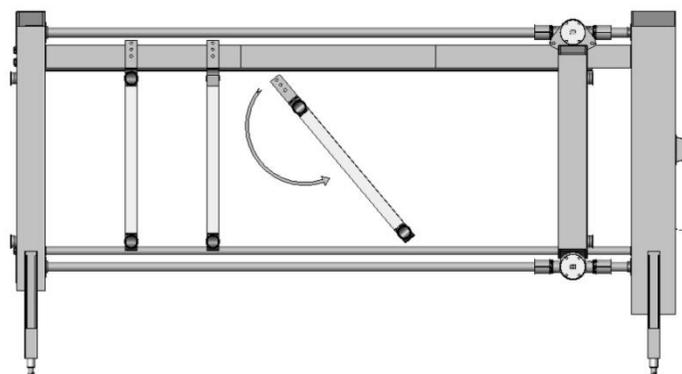
The AR51-D is equipped with a pressure gauge visible to the operator during normal operation. This gauge shows the pressure being developed by the hydraulic system. The system pressure required to close the press will vary depending on the age and condition of the heat exchanger plates and gaskets.

### **Frame Assembly/Disassembly Procedure:**

The AR51-D is typically shipped from the factory fully assembled. If it is necessary to disassemble the press the following procedure should be followed carefully. Since the AR51-D components are large and heavy, great care must be exercised to prevent injury to workers and/or possible damage to the heat exchanger during installation. Sufficient support structures must be used to raise and hold components for each phase of the process. The component weights listed in these procedures are presented to assist in selecting appropriate lifting mechanisms. If you are not confident in your understanding of any of these procedures, contact AGC Heat Transfer for assistance. To complete this procedure you will need special support stands and spindle carriage assemblies. Contact your AGC distributor to arrange a loan of these items.

**Disassembly:** This section will describe two different methods for disassembly. The first method is for situations where space is limited and the press can not be laid on its side. This method is more complicated and will require special support stands (available from AGC). The second method lays the press on its side on jack stands. This method will require two forklift trucks or other lifting devices.

**Step D1.** If the press is equipped with any terminal assemblies, mark each terminal for location and direction. Remove the terminals by lifting the terminal slightly. Next remove the clip holding the terminal roller pin in location. Remove the pin and the terminal roller. The terminal can then be tilted and removed from the press. Repeat for any additional terminals, noting the location and direction for each. See the figure below. An AGC standard terminal (2-5/8" wide) weighs approximately 335 pounds and an AGC wide terminal (4-1/8" wide) weighs approximately 440 pounds.



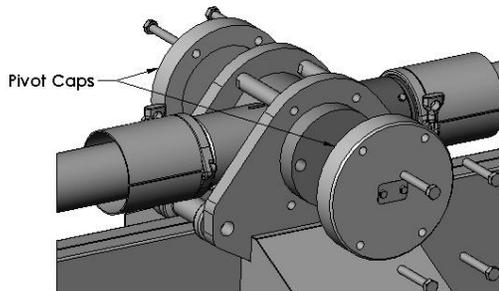
**Step D1**

### **Standing Disassembly:**

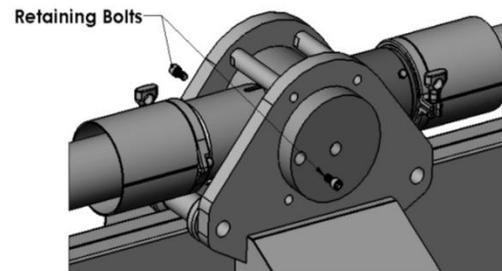
**Step D2.** Remove the Follower drive components.

D2.1 Remove the 4 follower pivot caps from the follower using a 3/4" wrench or socket.

D2.2 Remove the 4 retaining bolts from the pivot support using a 5/16" hex wrench.



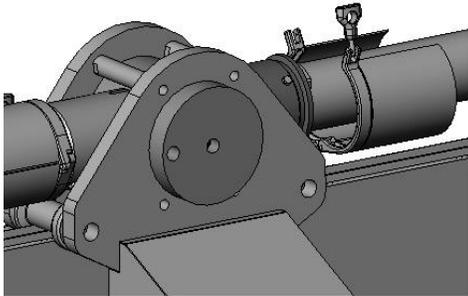
**Step D2.1**



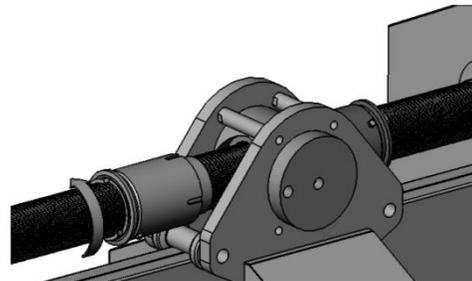
**Step D2.2**

D2.3 Remove the 4 catch trays by loosening the thumb screws on each.

D2.4 Turn the upper and lower follower retractor nuts counter-clockwise until at least 6" of clearance exists between the follower and the nut.



**Step D2.3**



**Step D2.4**

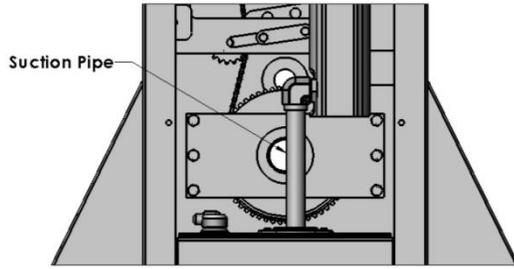
D2.5 Carefully push the follower toward the retractor nuts. This will allow the spindle drive nut to be turned clockwise when removing the spindle screws later in the disassembly process.

**Step D3.** Remove the end support spindle drive components.

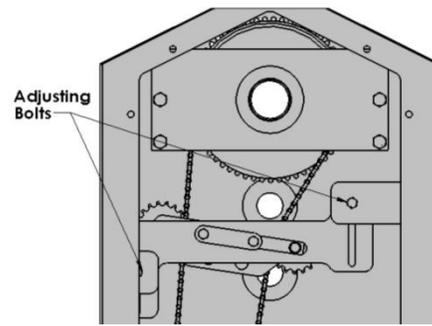
D3.1 Remove the end support upper and lower covers using a 7/16" wrench or socket.

D3.2 Remove the suction pipe from the pump using a pipe wrench.

D3.3 Remove the chain tensioners top and bottom by removing the 5/8" adjusting nuts. Once the tensioners are unbolted, find the connecting link on each drive chain. Remove the connecting links then the drive chains.



**Step D3.2**

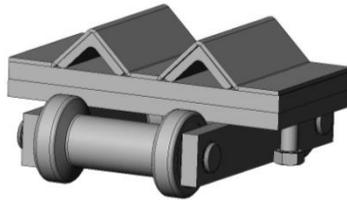


**Step D3.3**

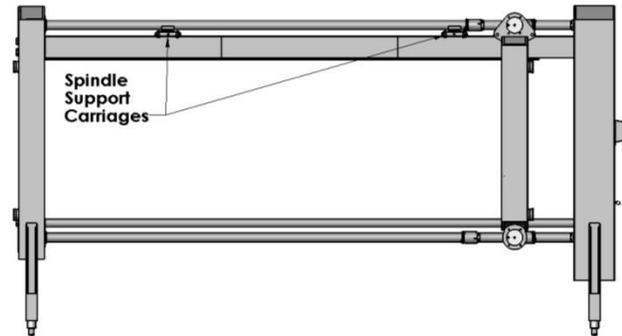
D3.4 Using two spindle support carriages, support the top spindle in two locations. Using a 3/4" wrench, adjust the lifting screws to support but not lift the spindle screw. The spindle should be centered in the follower bore.

D3.5 Remove the sprocket support plates top and bottom by removing the 6 hex bolts using a 3/4" wrench or socket.

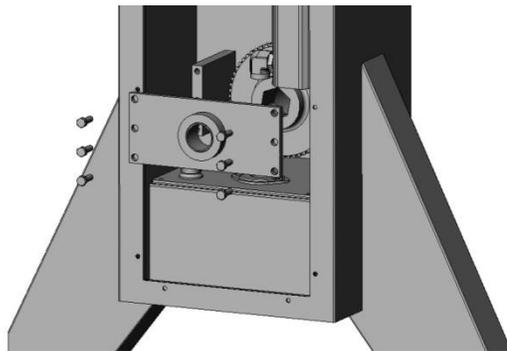
D3.6 Remove the sprockets and upper spindle shaft bushing using a 3/16" hex wrench. Note the spindle shaft bushing is held in place with two set screws.



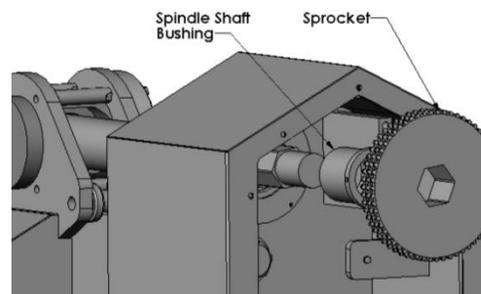
**Step D3.4a**



**Step D3.4b**



**Step D3.5**

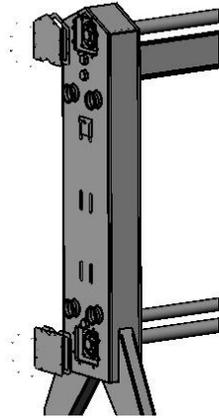


**Step D3.6**

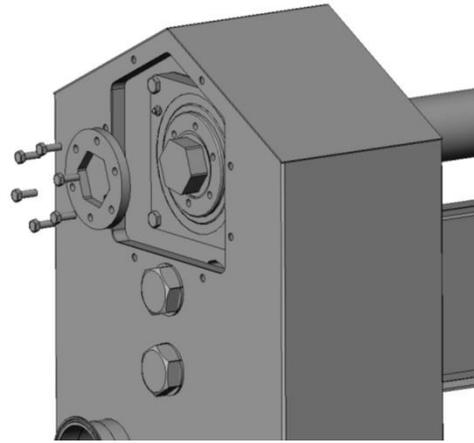
**Step D4.** Remove the bearing retainer components from the fixed end.

D4.1 Remove the fixed end access covers using a 7/16" wrench.

D4.2 Remove the 6 hex bolts from upper spindle retaining ring using a 9/16" wrench. Then remove the retaining ring.



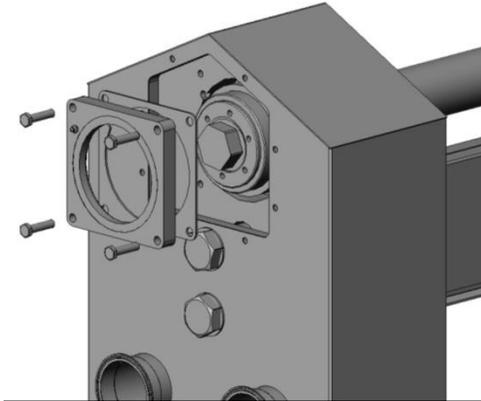
**Step D4.1**



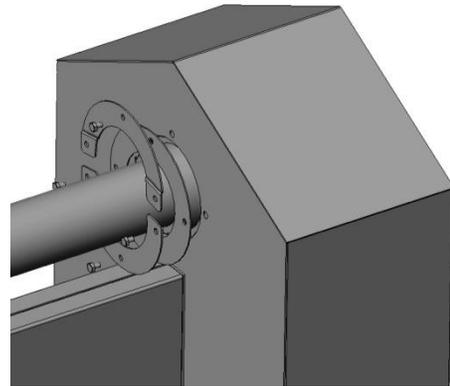
**Step D4.2**

D4.3 Remove the 4 bolts securing the upper bearing retainer plate using a 3/4" wrench. Then remove the plate and bronze bushing.

D4.4 Remove the fixed end upper and lower trim rings using a 7/16" wrench to remove the 4 hex bolts in each. Also remove the gasket at this time.



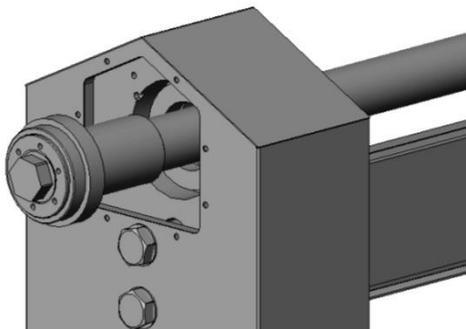
**Step D4.3**



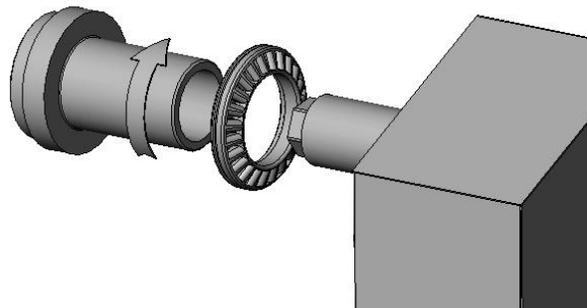
**Step D4.4**

D4.5 Using rigging suitable to support 1000 pounds, support the top spindle. Next, carefully slide the spindle through the fixed end. It may be necessary to move the follower drive nut toward the end support by turning it clockwise.

D4.6 Remove the spindle end nut and thrust bearing from the top spindle by turning it counterclockwise.

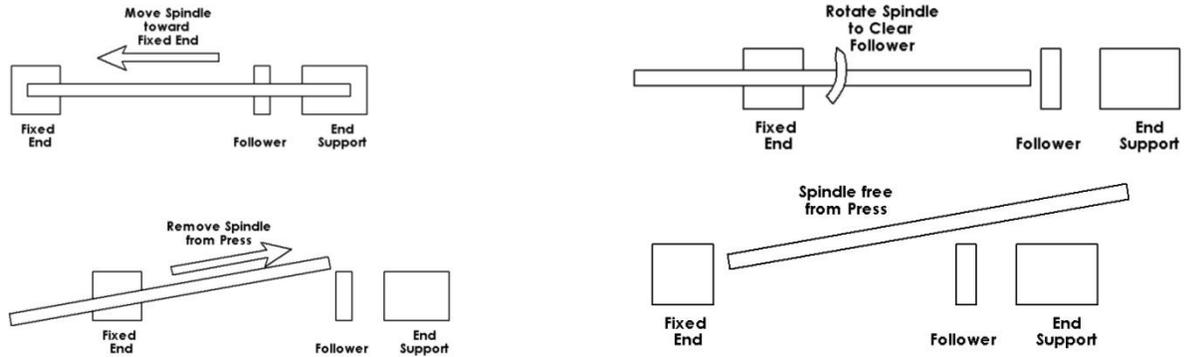


**Step D4.5**



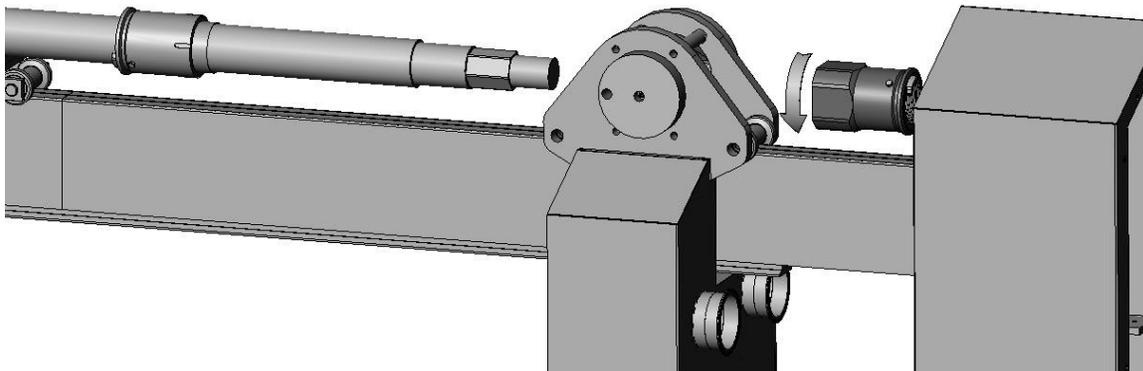
**Step D4.6**

**Step D5.** Remove the upper spindle. Caution: Each spindle can weigh up to 850 pounds depending on size. When removing a spindle, support it with rigging capable to withstand the weight and is also flexible enough to slide the spindle first partially through the fixed end, then when it is clear of the follower, tilted such that it can be removed from the fixed end and free from the press. Figure D5 shows a block diagram of the spindle movement described.



**Figure D5**

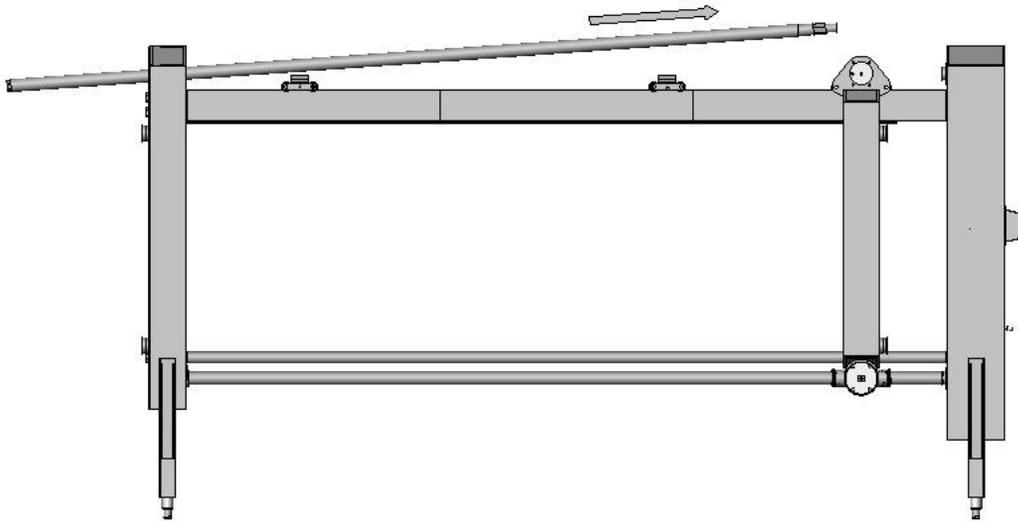
D5.1 Carefully slide the spindle toward the fixed end. As the spindle end moves out of the end support turn the follower drive nut clockwise to thread it off the spindle shaft.



**Step D5.1**

D5.2 Once the follower drive nut is removed from the spindle shaft, push the spindle through the follower.

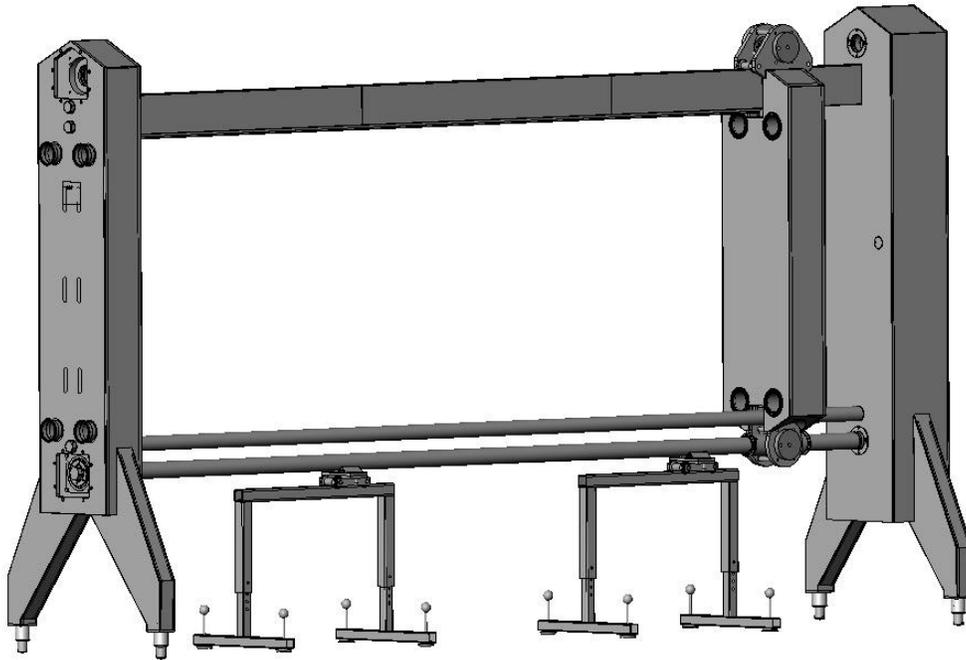
D5.3 Carefully lift the upper spindle, tilting it over the follower. Move the spindle toward the end support freeing it from the fixed end.



### Step D5.3

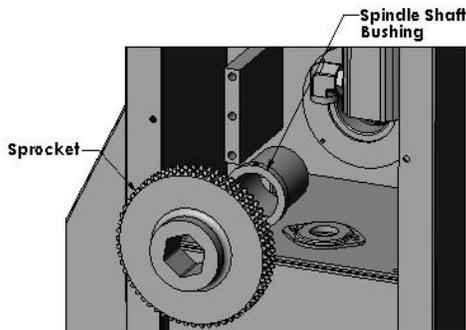
**Step D6.** Remove the lower spindle. Refer to the upper spindle diagrams for part identification.

- D6.1 Position the spindle support stands directly under the lower spindle. Adjust the support stands so the space between the stand and the lower spindle is approximately 2-1/2".
- D6.2 As with the upper spindle, position the spindle support carriages under the spindle on top of the support stands. Adjust the lifting bolt using a 3/4" wrench to support the spindle and center it in the follower pivot nut.

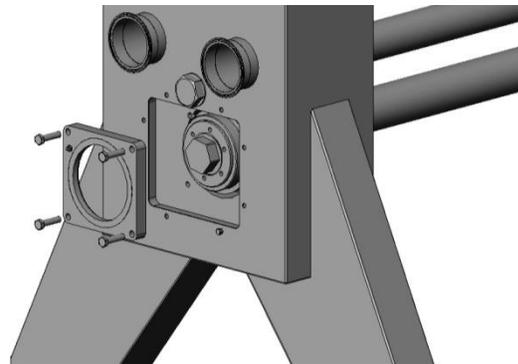


### Step D6.2

- D6.2 On the end support, remove the lower spindle shaft bushing by loosening the set screws with a 3/16" hex wrench.
- D6.3 On the fixed end, remove the lower bearing retainer plate and bronze bushing by removing the 4 bolts with a 3/4" wrench.



**Step D6.2**

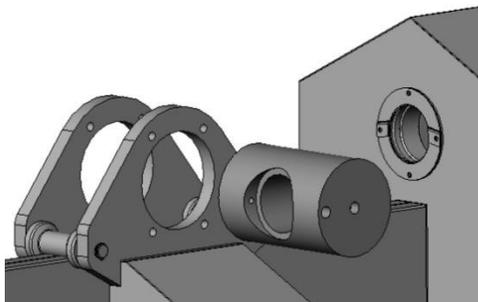


**Step D6.3**

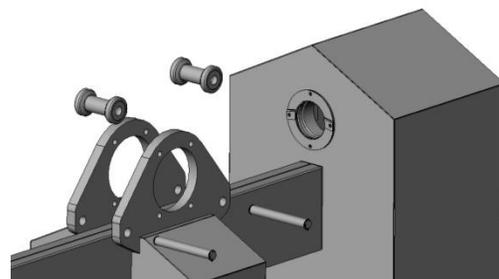
- D6.4 Slide the bottom spindle through the fixed end far enough to access the end nut and thrust bearing. It may be necessary to screw the follower drive nut toward the end support.
- D6.5 Remove the spindle end nut and thrust bearing from the lower spindle.
- D6.6 Remove the follower drive nut.
- D6.7 Using rigging suitable to hold 1000 pounds support the bottom spindle, carefully slide the spindle through the fixed end. Unscrew the follower drive nut to remove it from the spindle.
- D6.8 As with the upper spindle, carefully tilt the spindle enough to clear the follower. Slide the lower spindle free from the press.

**Step D7.** Remove the Follower. Note: The Follower weighs approximately 1800 pounds and could be damaged if mishandled.

- D7.1 Remove the follower pivot nuts (upper and lower). Note each pivot nut weighs approximately 50 pounds.
- D7.2 Lift the follower slightly to remove the load on the follower rollers.
- D7.3 Remove the follower rollers and pins.

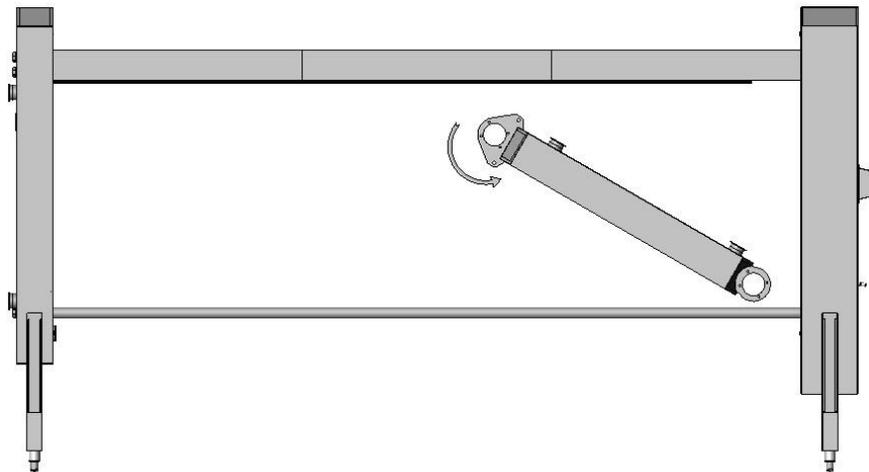


**Step D7.1**



**Step D7.3**

- D7.4 Carefully tilt the follower to free it from the upper and lower frame rails. Then remove it from the press.



### **Step D7.4**

**Step D8.** Remove the bottom rail assembly. The bottom rail can weigh up to 500 pounds depending on size.

- D8.1 Support the bottom rail with rigging suitable to hold at least 500 pounds.
- D8.2 Remove the bottom rail bolts at the fixed end and the end support using a 2-3/8" socket.
- D8.3 Remove the bottom rail from the press. Note: It may be necessary to loosen the upper rail bolts to allow the bottom rail to slide out.

**Step D9.** Remove the fixed end assembly. The fixed end weighs approximately 2700 pounds. Great caution should be used when removing the fixed end.

- D9.1 Place a support structure, or appropriate rigging, under the top rail assembly. The support should be placed in the approximate center of the top rail. The top rail can weigh up to 1700 pounds depending on the size.
- D9.2 Attach rigging to the fixed end to keep it erect once the upper rail bolts are removed. (Rigging can be fixed to the spindle bore).
- D9.3 Using a 2-3/8" socket remove the upper rail bolts from the upper rail at the fixed end.
- D9.4 Carefully lay the fixed end down with the ports pointing up.

**Step D10.** Separate the top rail from the end support. The end support weighs approximately 1700 pounds and the top rail can weigh as much as 1700 pounds depending on size.

- D10.1 Attach rigging to the end support to ensure it remains standing once it is separated from the top rail.
- D10.2 If the end support will be laid on its side, either remove the hydraulic oil from the reservoir or remove the tank assembly from the frame.
- D10.3 Ensure the top rail is properly supported so it will not tip once it is unbolted from the fixed end
- D10.4 Remove the 2 remaining rail bolts from the top rail at the end support.
- D10.5 Carefully lay the end support and top rail down.

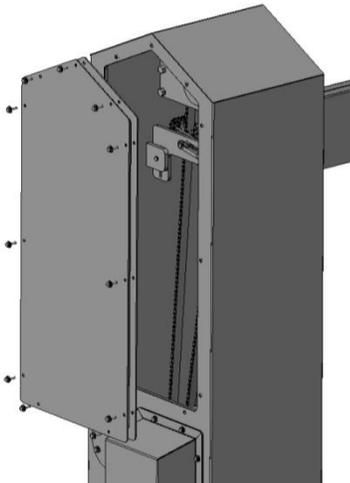
### **Disassembly Alternative:** (space permitting)

This method requires the use of 4 jack stands and for frame size 7 and above, two lifting devices (i.e. forklift truck) to tip the frame on its side. Frames size 6 and below can be safely tilted over

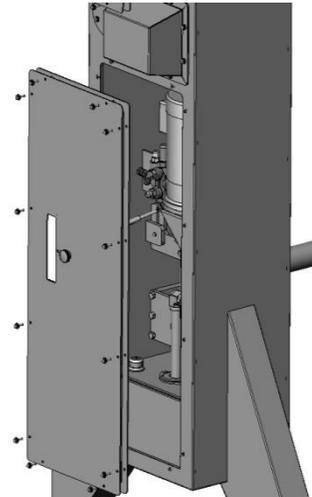
with one lifting device, but still require 4 jack stands. The jack stands can be obtained from AGC Heat Transfer. If you are using your own stands, two different heights are required. One set at least must be at least 14 inches tall and capable of holding 2500 pounds each. The other set needs to have the same capacity but must be 8-3/4 inches taller than the first set.

**Step DA2.** With the AR51-D standing, remove the end support upper and lower covers.

DA2.1 Using a 7/16" wrench, remove the 11 hex screws from the top cover and the 12 hex screws from the bottom cover.



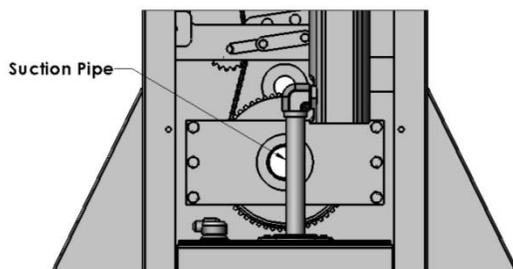
**Step DA2.1a**



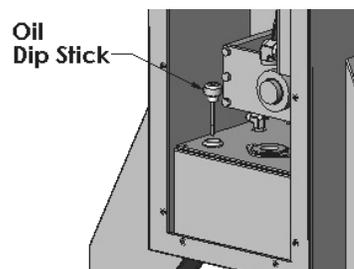
**Step DA2.1b**

DA2.2 Remove the suction pipe from the oil tank using a pipe wrench.

DA2.3 Check the oil level in the hydraulic tank. If the tank is full it will be necessary to remove the oil from the tank. Alternatively, the tank could be removed entirely from the end support.



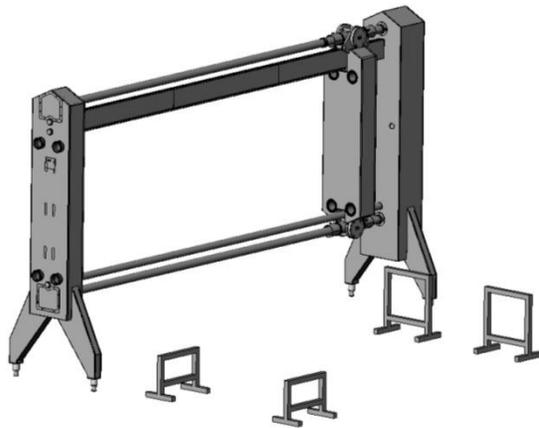
**Step DA2.2**



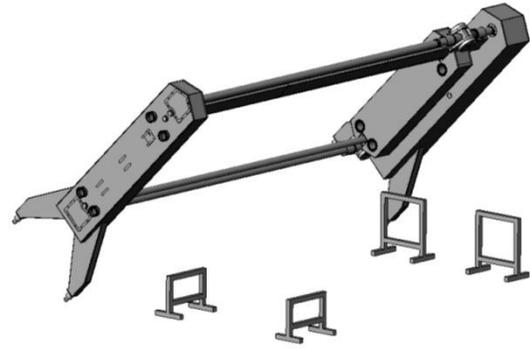
**Step DA2.3**

DA2.4 Position the stands next to the press in preparation for tilting the press on its side. Note the shorter stands will be under the fixed end and the taller will be under the rails

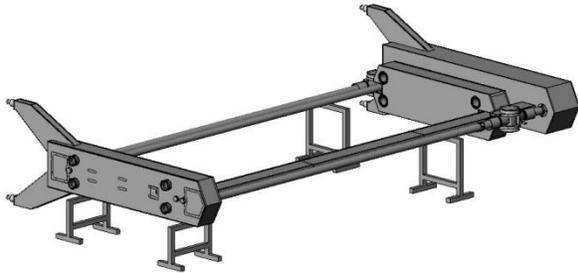
DA2.5 As previously noted, frames size 7 and larger will require two lifts, one positioned near each end, to tilt the frame. Smaller frames can be safely moved with one lift positioned near the center. To tilt the press, lift under the top rail slightly. Move the lift backward to tilt the frame onto two feet. Slowly lower the lift while moving back until the press is laying on the stands. Note the stands under the rails are positioned behind the follower.



**Step DA2.4**



**Step DA2.5a**



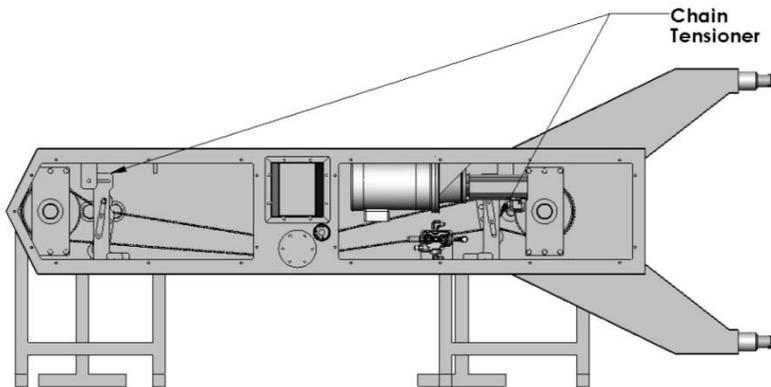
**Step DA2.5b**



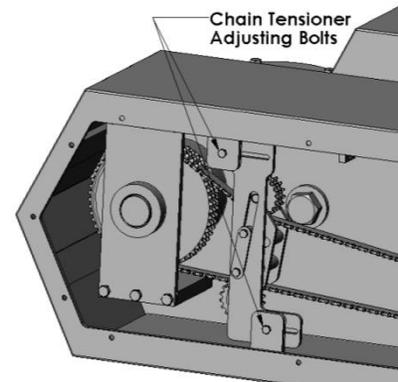
**Step DA2.5c**

**Step DA3.** Remove the end support assembly.

- DA3.1 Using a 5/8" wrench, remove the chain tensioner assemblies by removing the chain tensioner adjusting bolts.
- DA3.2 Locate the connecting link on each drive chain. Remove the link, then remove the chains.

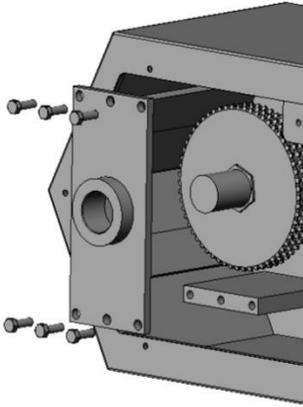


**Step DA3.1a**

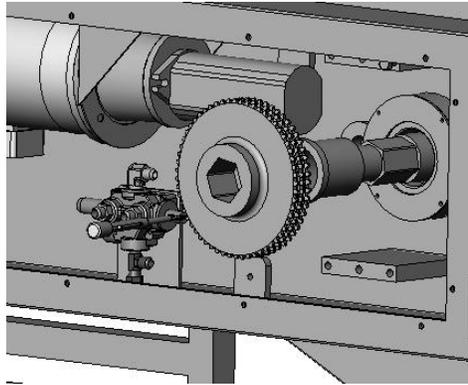


**Step DA3.1b**

- DA3.3 Remove the sprocket support plates upper and lower. These plates are held in place with 6 hex bolts each. Use a 3/4" wrench to remove the bolts.
- DA3.4 Support the end support with a forklift.
- DA3.5 Remove the upper and lower sprockets and spindle bushings.



**Step DA3.3**



**Step DA3.4**

DA3.5 Remove the upper and lower rail bolts using a 2-3/8" socket.

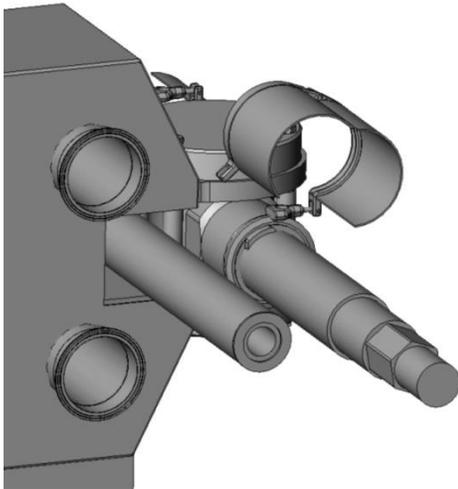
DA3.6 Carefully remove the end support by moving it away from the spindle screws.

**Step DA4.** Remove the follower assembly. The follower weighs approximately 1800 pounds. Exercise caution when removing the follower assembly.

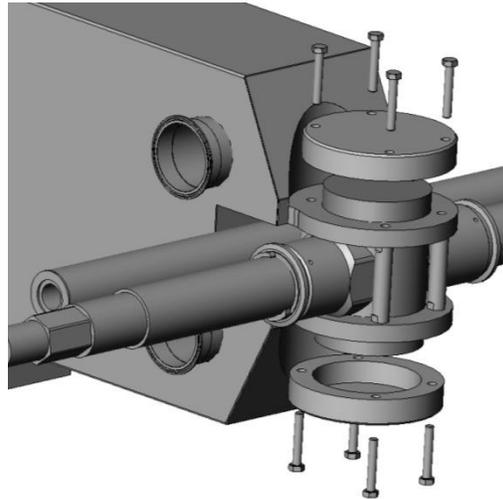
DA4.1 Support the follower with a forklift.

DA4.2 Remove the 4 catch trays by loosening the thumb screws on each.

DA4.3 Remove the 4 follower pivot caps using a 3/4" wrench.



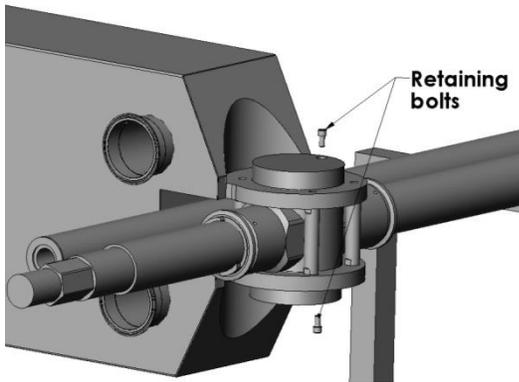
**Step DA4.2**



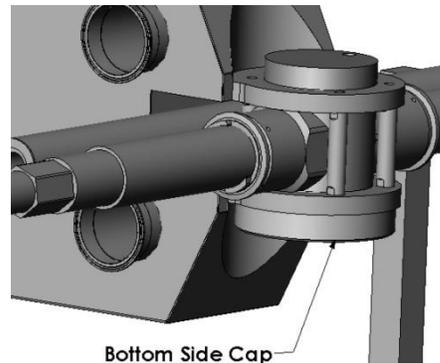
**Step DA4.3**

DA4.4 Using a 5/16" hex wrench, remove the 4 retaining bolts from the pivot nuts.

DA4.5 Temporarily reinstall 2 of the pivot caps on the bottom side of the follower pivot nut. These will ensure the pivot nuts don't fall out when the spindles are removed.

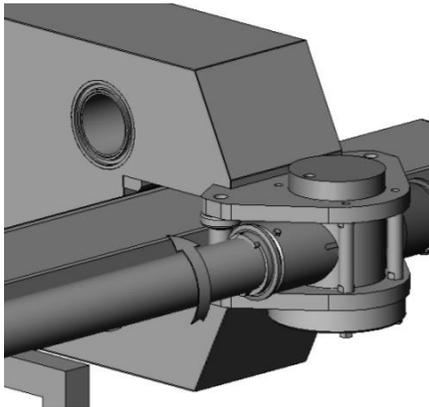


**Step DA4.4**

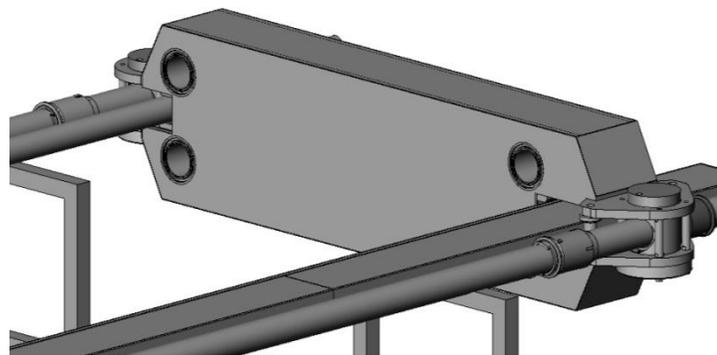


**Bottom Side Cap**  
**Step DA4.5**

DA4.6 Turn the follower retractor nuts counterclockwise to provide approximately 8 inches of clearance between the follower pivot nut and the retractor nut.



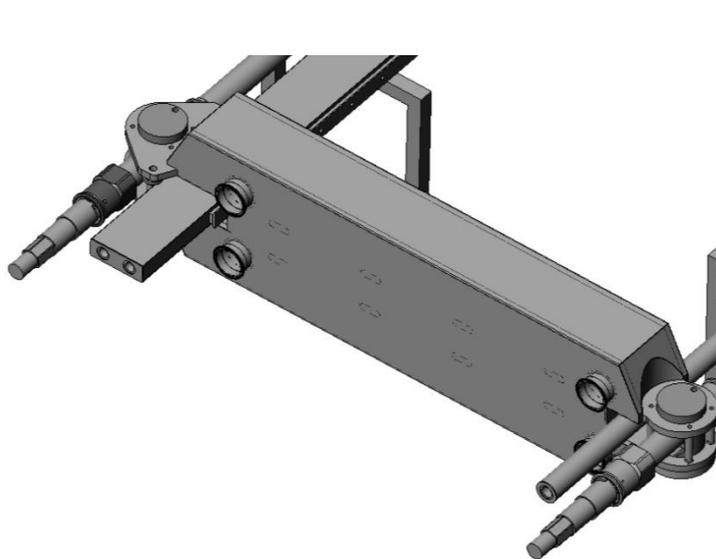
**Step DA4.6a**



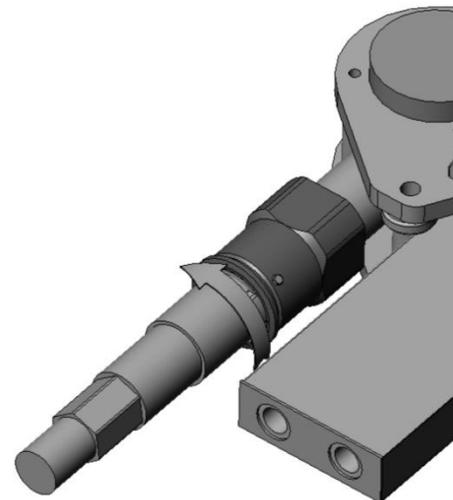
**Step DA4.6b**

DA4.7 Carefully move the follower toward the fixed end using the forklift. The follower needs to move far enough to allow the spindle drive nuts to turn on the spindles.

DA4.8 Remove both spindle drive nuts from the spindles by turning them on their respective shafts.



**Step DA4.7**



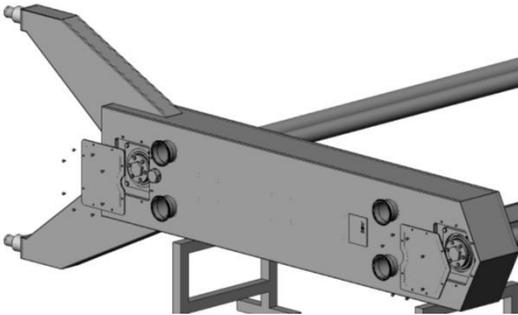
**Step DA4.8**

DA4.9 Using the forklift, carefully back the follower off the spindle shafts and frame rails.

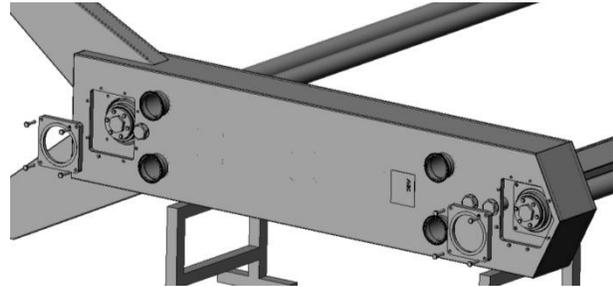
**Step DA5.** Remove the spindle drive shafts.

DA5.1 Using a 7/16" wrench remove the 8 hex bolts securing the top and bottom covers on the fixed end assembly. Then remove the covers.

DA5.2 Remove the upper and lower bearing retainer plates. These plates are held in place with 4 bolts each.



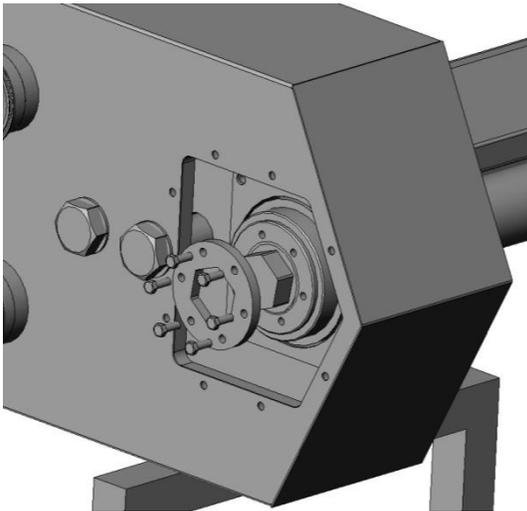
**Step DA 5.1**



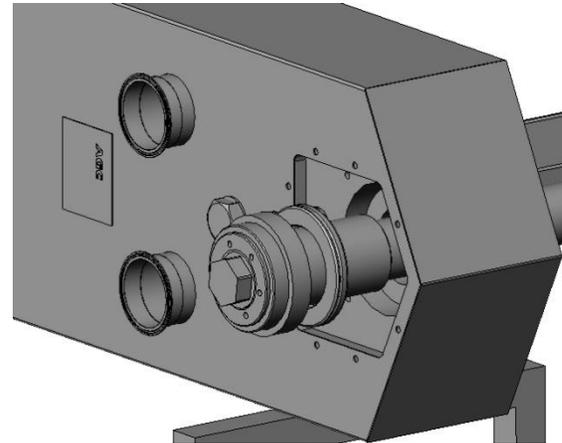
**Step DA 5.2**

DA5.3 Remove the 6 hex head bolts securing the upper and lower spindle retaining rings using a 9/16" wrench. Then remove the rings.

DA5.4 Using a lifting strap, carefully feed the spindles one at a time through the fixed end far enough to allow access to the spindle end nut.



**Step DA 5.3**



**Step DA 5.4**

DA5.5 Turn the spindle end nut counterclockwise to remove it and the thrust bearing from the spindle shaft. Once removed the shaft can be removed from the fixed end.

DA5.6 Repeat the procedure to remove the other spindle.

**Step DA6.** Remove the upper and lower rails from the fixed end.

DA6.1 Using rigging capable of supporting 1700 pounds, support the top rail.

DA6.2 Remove the two bolts holding the upper rail in place.

DA6.3 Support the bottom rail with rigging capable of holding 500 pounds.

DA6.4 Remove the bolt securing the bottom rail.

## **Assembly:**

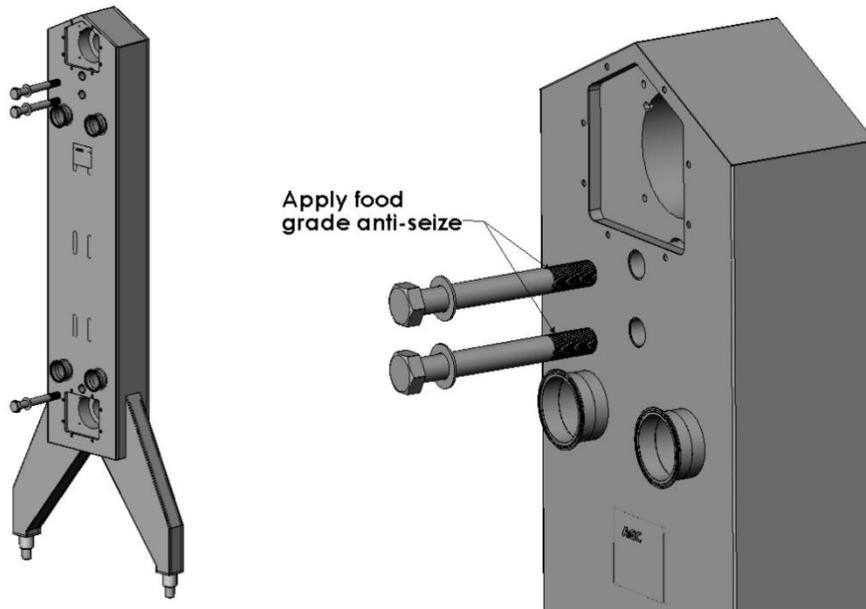
The AR51-D should be assembled by qualified maintenance mechanics who are trained to work with large machinery. Many components are large and need to be handled correctly to prevent injuries to workers and/or damage to the equipment. Each AR51-D is fully assembled and tested at the factory prior to shipping. No components will require modification to be properly installed assuming there was no damage incurred in shipping. If your AR51-D arrived damaged, contact AGC Heat Transfer or your local distributor for assistance. As with the disassembly procedure, two variations for assembly will be presented. If space permits, the easier method has the press laid on its side for most of the process.

If space is limited, the press can be assembled by standing each piece then bolting the components together. This method will be described first.

## **Standing Assembly:**

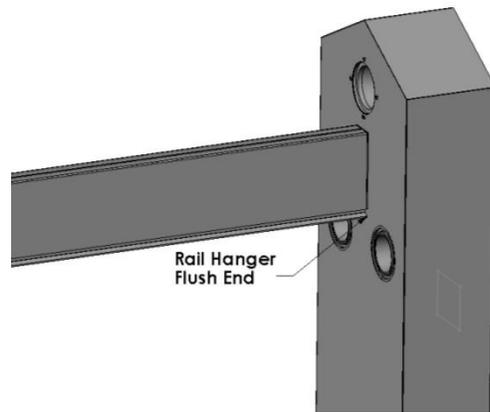
**Step A1.** Position the fixed end in a standing position.

- A1.1 Using rigging suitable for supporting 2700 pounds lift the fixed end to a standing position.
- A1.2 Locate the 3 long rail bolts, the lock washers and flat washers.
- A1.3 Apply food grade anti-seize to the threads and put the bolts through the fixed end assembly bolt holes.



**Step A2.** Install the upper rail assembly. The upper rail has a hanger strip bolted to the underside. The flush end will be against the fixed end.

- A2.1 Position the upper rail next to the fixed end. Lift the upper rail assembly until it aligns with bolts protruding through the fixed end. Shift the rail against the fixed end then tighten the bolts just hand tight to keep the upper rail secured to the fixed end, these bolts will be fully tightened later in the process.



A2.2 Keep the lifting mechanism under the upper rail until the end support is in place.

**Step A3.** Position the end support.

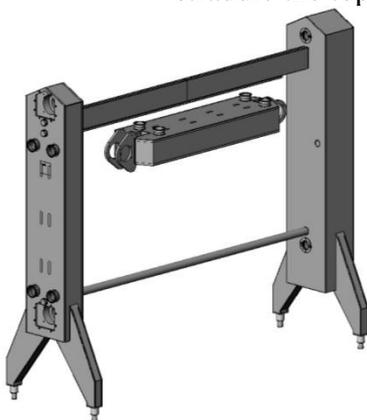
- A3.1 Lift the end support vertical and position it at the end of the upper rail.
- A3.2 Align the end support upper rail bolt holes with the top rail bolt holes.
- A3.3 Install the short rail bolts with a flat washer on each. Tighten the bolts hand tight until the bottom rail is installed.
- A3.4 The lifting mechanism used to support the upper rail can now be removed.

**Step A4.** Install the bottom rail assembly.

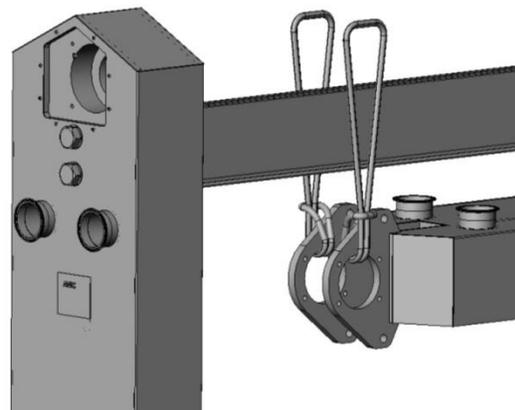
- A4.1 Carefully lift the bottom rail into position. It may be necessary to spread the bottoms of the fixed end and end support slightly to move the bottom rail into position.
- A4.2 Install the rail bolts through the fixed end and the end support. Note: The bottom rail bolt on the end support will not have a separate washer. The washer is incorporated into the end support.
- A4.3 Using a 2-3/8" socket wrench, fully tighten all 6 rail bolts.

**Step A5.** Install the follower assembly.

- A5.1 Using a forklift rated for at least 1800 pounds move the follower into position under the top rail. Note the ports are facing up and the wider hanger tabs are toward the fixed end. This installation procedure may allow the follower to slide on the lift forks. Protect the finish on the follower by placing cardboard on the forks.
- A5.2 Using lifting straps, rig the follower as shown. Note the straps straddle the top rail.

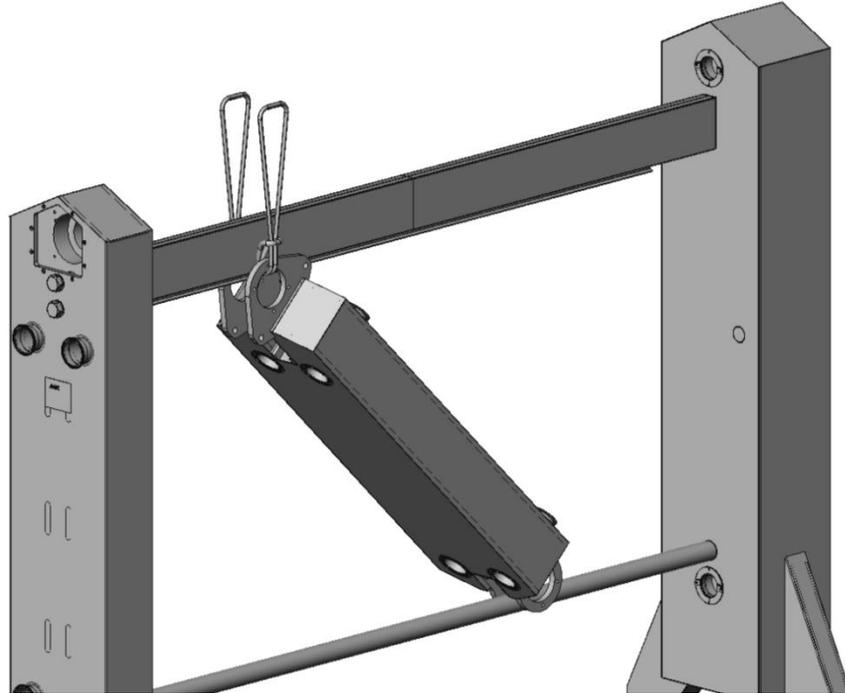


**Step A5.1**



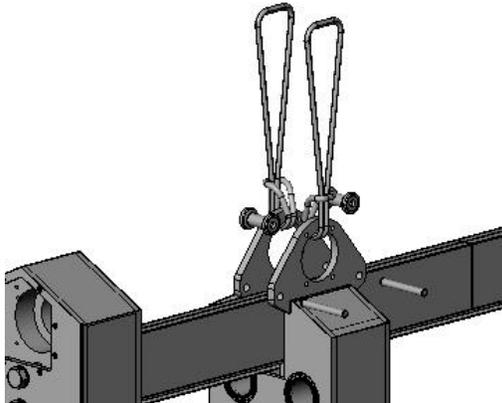
**Step A5.2**

A5.3 Slowly lower the lift that is under the follower while holding the lift supporting the slings stationary. As the follower begins to come vertical, the lift holding the slings can be raised.

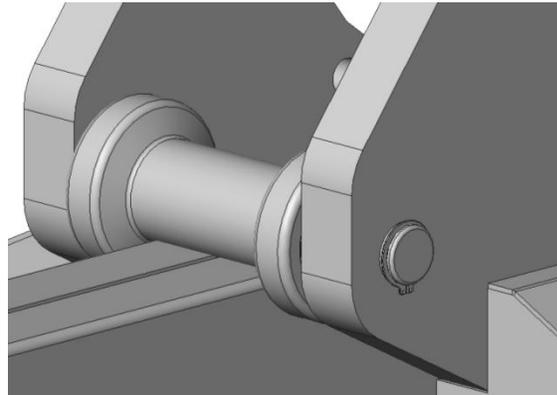


**Step A5.3**

A5.4 Once the follower is vertical and fully supported by the slings, the follower rollers can be installed. Lift the follower high enough to install the rollers and secure the roller pins with C clips.



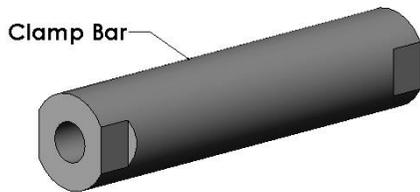
**Step A5.4a**



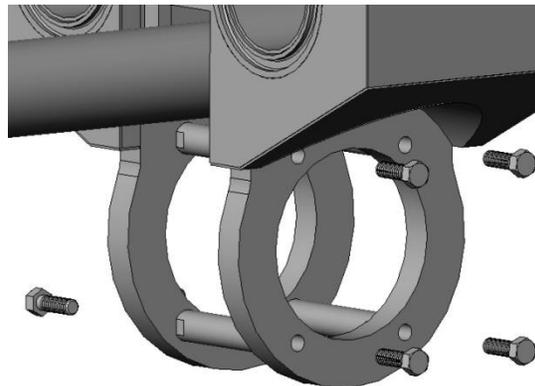
**Step A5.4b**

**Step A6.** Install the follower pivot nuts. The follower pivot nuts are close tolerance components and it is imperative the follower support tabs are parallel in order for the pivot nut to assemble correctly.

A6.1 Beginning with the lower pivot nut, slide the pivot nut through the follower tabs. If the nut does not easily slide through the bore, it is necessary to temporarily install the clamp bars to align the follower tabs. Using 1-1/2" long 1/2-13 hex bolts, install the clamp bars between the follower tabs.

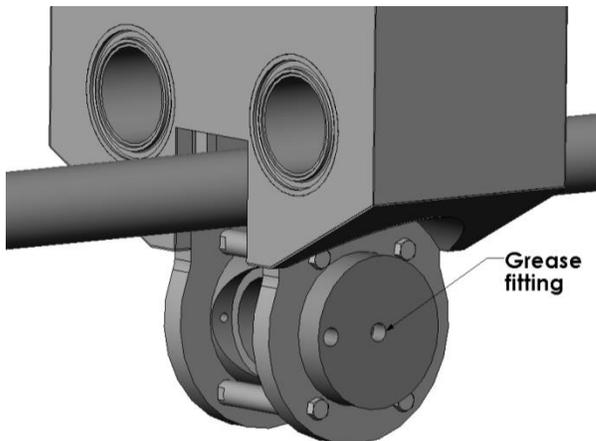


**Step A6.1a**



**Step A6.1b**

A6.2 Install the lower pivot nut. The pivot nut has a grease fitting on one side only. This grease fitting should face the same side for both top and bottom pivot nuts.

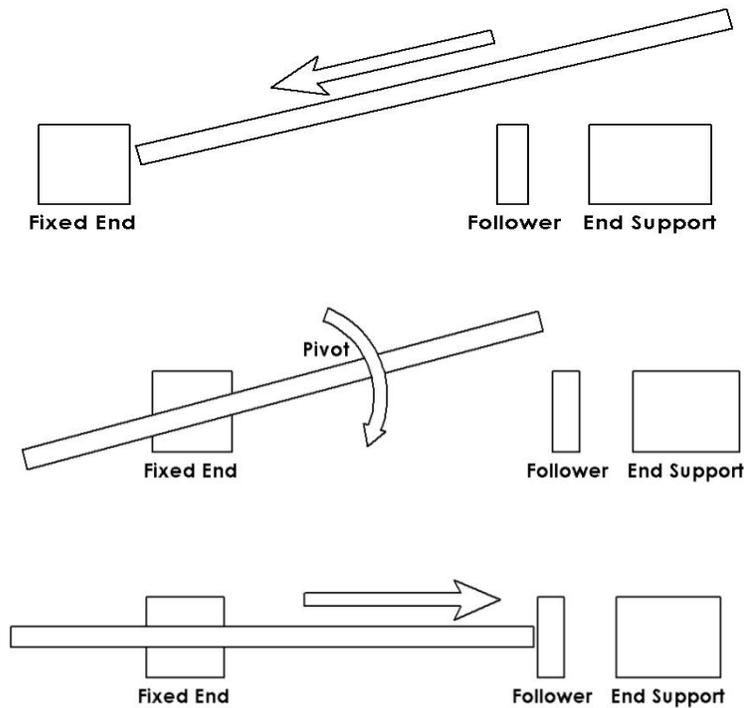


**Step 6.2**

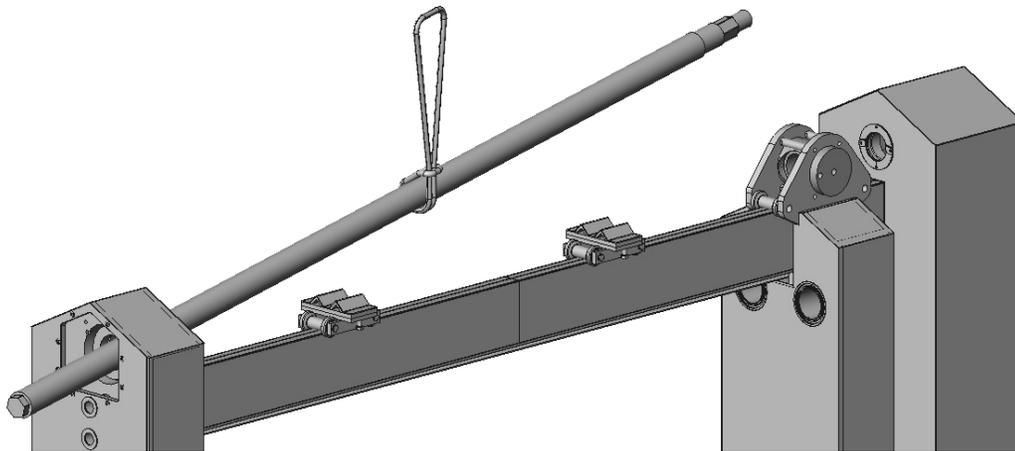
A6.3 Repeat the installation procedure for the upper pivot nut ensuring the grease fitting points to the same side as the lower nut.

A6.4 Remove the temporary bolts holding the clamp bars in place.

**Step A7.** Install the upper spindle. The installation of the upper spindle is made much easier by using the spindle carriage kit from AGC Heat Transfer. Each kit contains two spindle carriages and two adjustable spindle stands. Installing the spindles with the press standing will require tilting the spindle first through the fixed end then swing it straight along the rail before sliding it through the follower and end support. The motion required is represented in the block diagram.

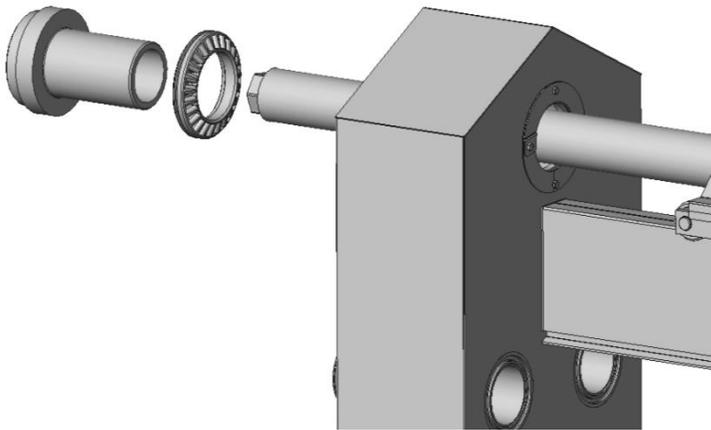


- A7.1 Roll the follower near the end support end of the press.
- A7.2 Place the two spindle carriages on the upper rail between the follower and the fixed end.
- A7.2 Using a lifting strap, lift the upper spindle high enough to slide it through fixed end spindle hole. Note the orientation of the spindle.

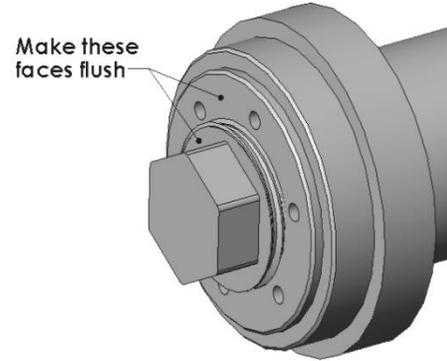


**Step A7.2**

- A7.3 Once the spindle has been inserted enough to clear the follower, rotate it so it rests in the spindle carriages. Adjust the lifting nut on each carriage so the spindle is parallel to the top bar and centered in the through bores in the fixed end and follower. Any vertical adjustment required can be made with the adjusting bolts on the carriages.
- A7.4 Install the upper thrust bearing and spindle end nut. The nut should be threaded so the face is flush with the machined shoulder on the spindle shaft.



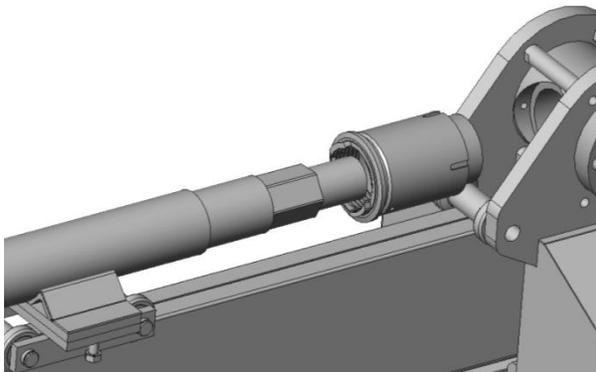
**Step A7.4a**



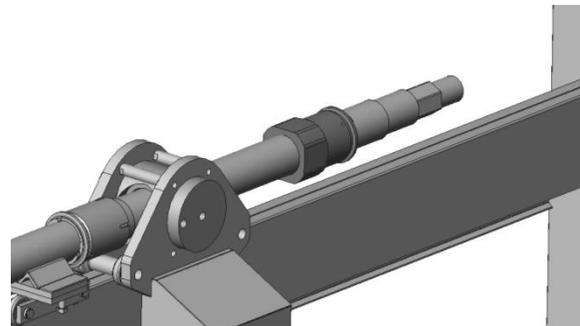
**Step A7.4b**

A7.5 Install the spindle retractor nut onto the spindle shaft. Thread the retractor nut onto the shaft approximately 30 inches.

A7.6 Install the spindle drive nut onto the spindle shaft. Thread the nut towards towards the follower. The spindle can be rolled along the top rail to provide the necessary clearance.



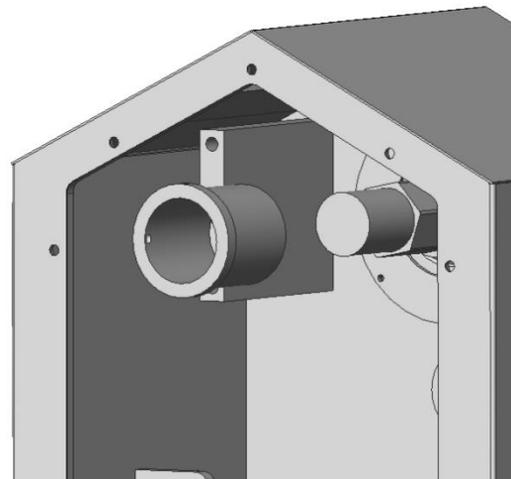
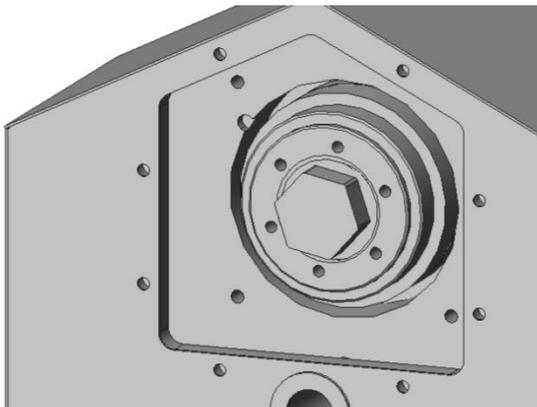
**Step A7.5**



**Step A7.6**

A7.7 Continue to move the spindle into the end support until the spindle end nut is fully seated in the fixed end.

A7.8 Install the upper spindle shaft bushing on the spindle through the end support. Using a 5/16" hex wrench tighten the 2 set screws on the bushing.

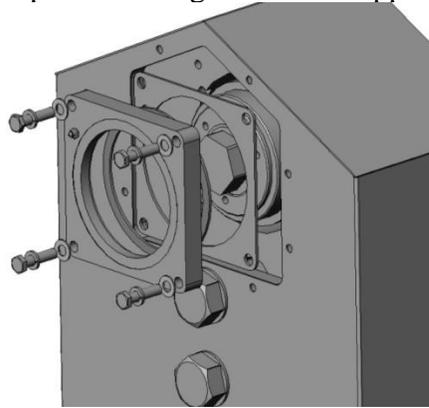


**Step A7.7**

A7.9 Install the upper spindle bearing retainer plate with bronze bearing and gasket. Ensure the gasket notch lines up with the grease notch in the fixed end.

A7.10 Remove the spindle carriages from the upper rail.

**Step A7.8**



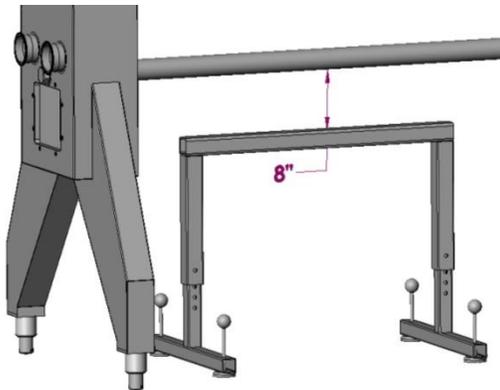
**Step A7.9**

**Step A8.** Install the lower spindle. As with the upper spindle, the lower spindle installation is made much easier by using the install kit. In fact the procedure for installing the lower spindle is identical to the upper spindle installation with the exception of the location.

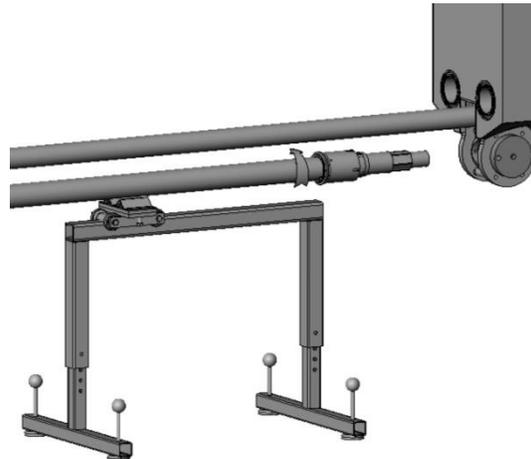
A8.1 From the install kit find the two adjustable stands. Position the stands under the bottom rail. Adjust the height of the stands so there is approximately 8 inches between the top of the stand and the bottom of the lower rail. Place a carriage on top each of the two stands.

A8.2 Using the same sling technique as with the upper spindle, maneuver the lower spindle through the fixed end then onto the carriages.

A8.3 Thread the follower retractor nut onto the lower spindle shaft. Thread the nut about 30 inches onto the shaft.



**Step A8.1**



**Step A8.3**

A8.4 Working at the fixed end side of the spindle, install the thrust bearing and spindle end nut. Carefully move the spindle through the fixed end and follower enough to install the lower spindle drive nut.

A8.5 Install the spindle drive nut on the lower spindle. Thread the nut on the shaft enough to be able to fully seat the end nut and thrust bearing in the fixed end.

A8.6 Install the spindle bearing retainer plate with bronze ring and gasket to secure the lower spindle into the fixed end.

A8.7 Inside the end support install the spindle shaft bushing.

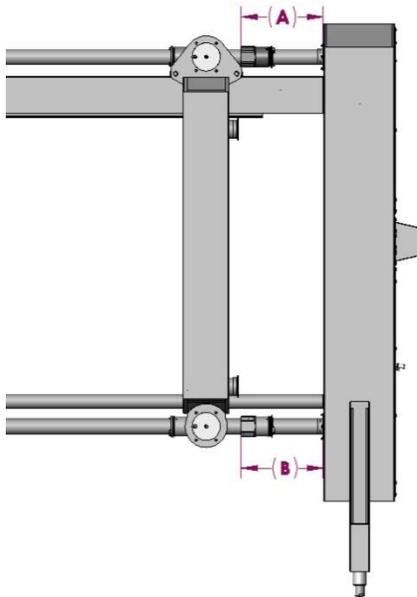
A8.8 Remove the spindle carriages and support stands.

**Step A9.** Position the follower. The follower must be parallel to the fixed end in order for the press to properly close the plate pack.

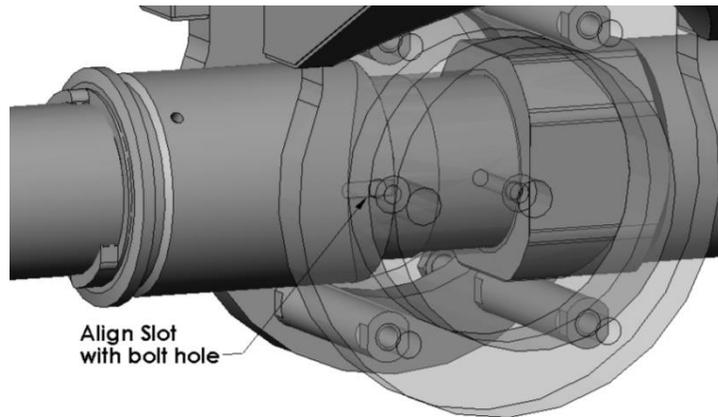
A9.1 With the follower pushed toward the fixed end, adjust the spindle drive nuts so they are an equal distance from the end support. The figure shows dimensions A and B. These must be equal and one flat on the four sided nut must be vertical.

A9.2 Once the drive nuts are positioned slide the follower toward the end support fully engaging the drive nuts.

A9.3 Turn the spindle retracting nuts counterclockwise to lock the follower against the drive nuts. Back the retracting nut off just enough to line up the slots with the hole in the pivot nut.



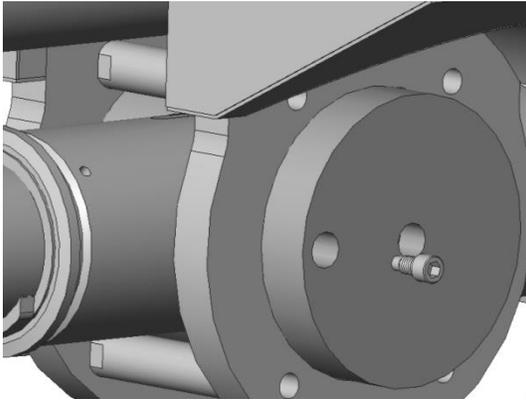
**Step A9.1**



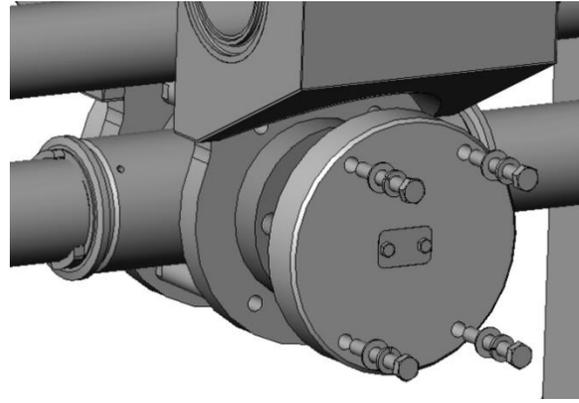
**Step A9.3**

A9.4 Insert the dog point locking bolts (2 upper and 2 lower) into the pivot nuts locking the retracting nuts in place.

A9.5 Install the pivot caps onto the follower. Note the position of the lube point on each pivot nut. Two of the caps are fitted with a removable access covers, these covers should be positioned on the side with the lube fitting.



**Step A9.4**

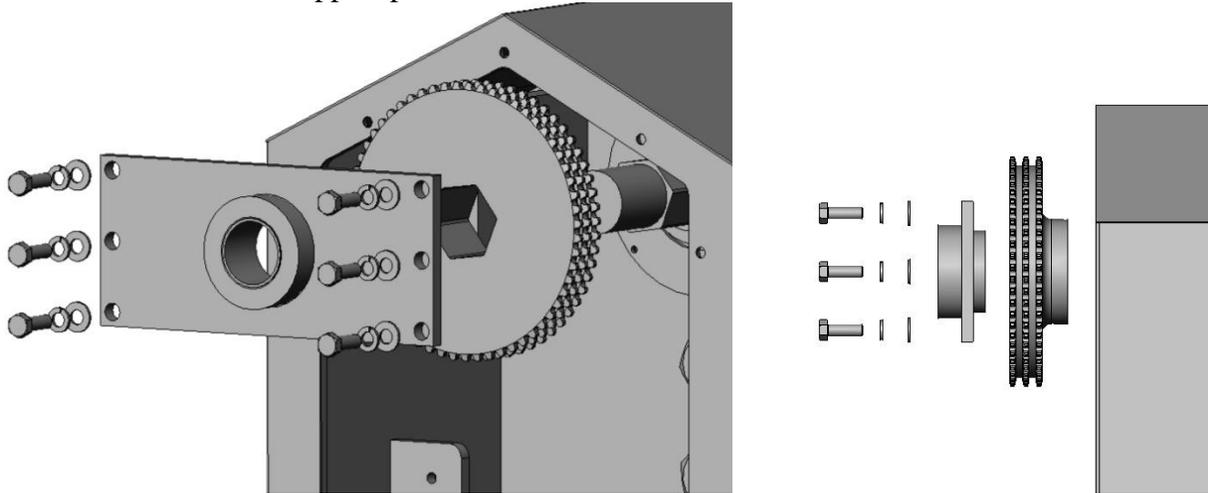


**Step A9.5**

**Step A10.** Install end support upper spindle drive components.

A10.1 Install the 60 tooth drive sprocket. Note the extended hub on the sprocket faces inward.

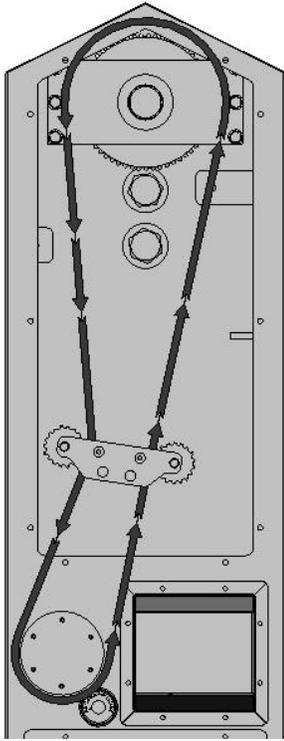
A10.2 Install the sprocket support plate. The plate must be installed with the shorter hub toward the sprocket side. Using a 3/4" wrench, secure the support plate with 6 hex bolts.



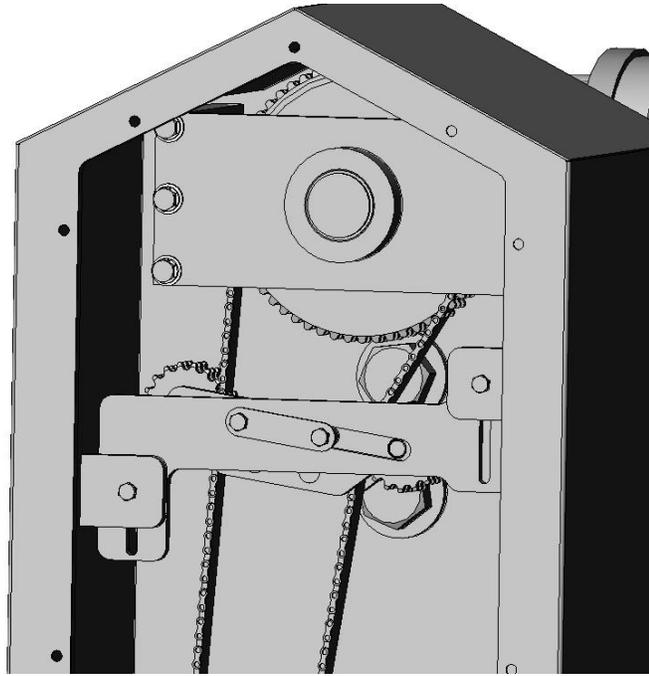
**Step A10.1/A10.2**

A10.3 Install the upper drive chain. When installing the chain, it is easier to also install the tensioner at the same time. Feeding the chain first through the tensioner then around the 60 tooth sprocket, then through the other side tensioner before looping it around the sprocket drive shaft. Connect the chain using the connector link.

A10.4 Install the upper tensioner bracket first to the tensioner using the two hex bolts and retaining plate. Next, slide the tensioner and bracket up the chain and secure it to the brackets welded in the end support. The tensioner is moved up to tighten the chain. Do not over tighten the chain. When properly adjusted, the chain should have approximately 3/8" movement when pinched together near the center.



**Step A10.3**



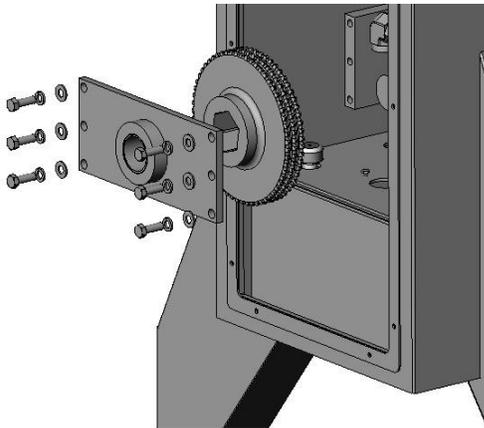
**Step A10.4**

**Step A11.** Install the end support lower spindle drive components.

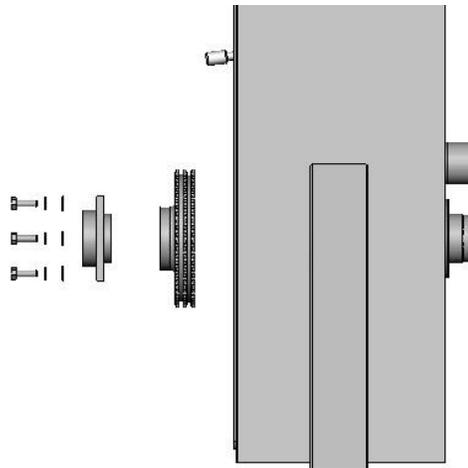
A11.1 If the hydraulic tank was removed, it should be re-installed prior to installing the lower spindle drive components.

A11.2 Install the lower 60 tooth drive sprocket. Note the extended hub should face outward.

A11.3 Using 6 hex head bolts, install the lower sprocket support plate. The longer hub should face outward.

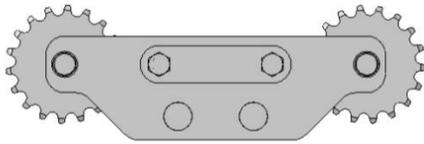


**Step A11.2**

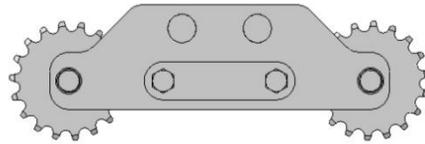


**Step A11.3**

A11.4 Following the same technique as with the top drive chain, thread the drive chain through the tensioner and around the sprockets. Note: The tensioners are identical and can be used in either location but must be turned 180 degrees for each location.

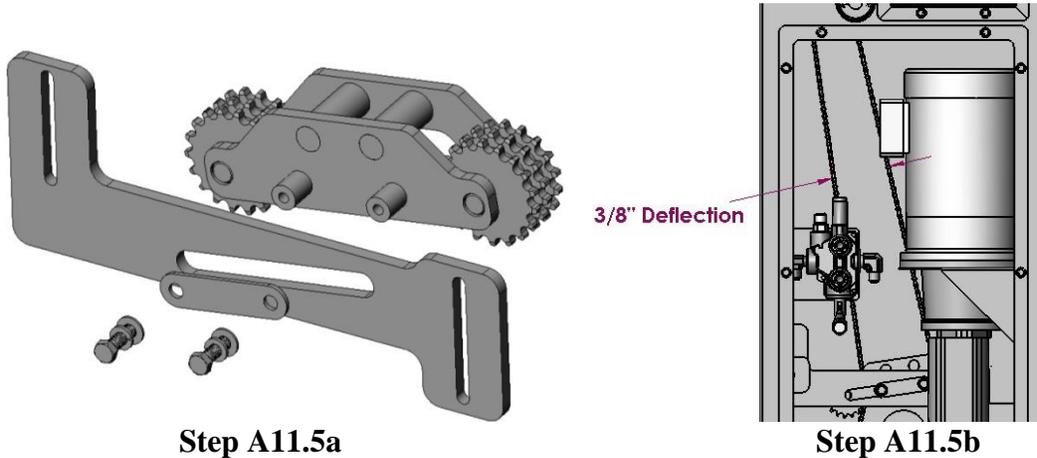


Upper



Lower

A11.5 Install the tensioner bracket onto the tensioner, then slide the tensioner down toward the large sprocket. Adjust the bracket to tighten the chain. As with the top chain, tighten the chain to give approximately 3/8" deflection.



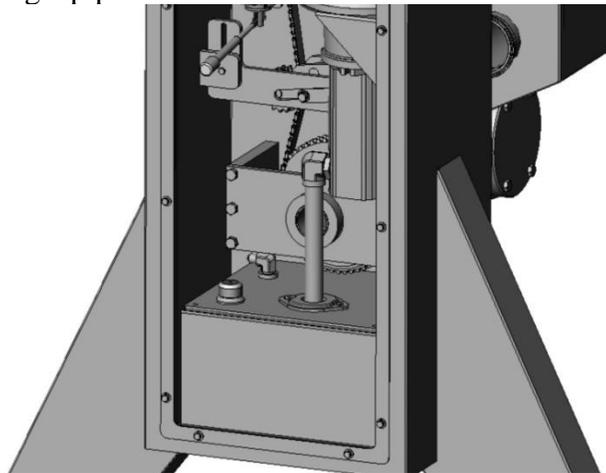
Step A11.5a

Step A11.5b

**Step A12.** Re-install the hydraulic suction tube.

A12.1 Clean the threaded end of the suction pipe. Apply thread sealing tape or compound to the threads.

A12.2 Feed the pipe into the flange on the tank. Then carefully thread the pipe into the fitting on the hydraulic pump. Tighten the pipe using a pipe wrench.

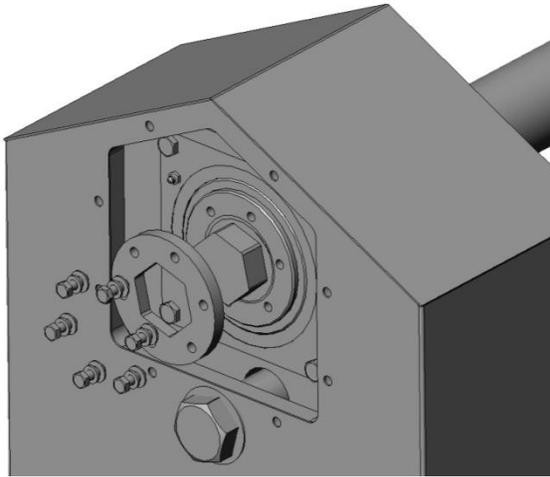


**Step A13.** Install the spindle lock rings in the fixed end.

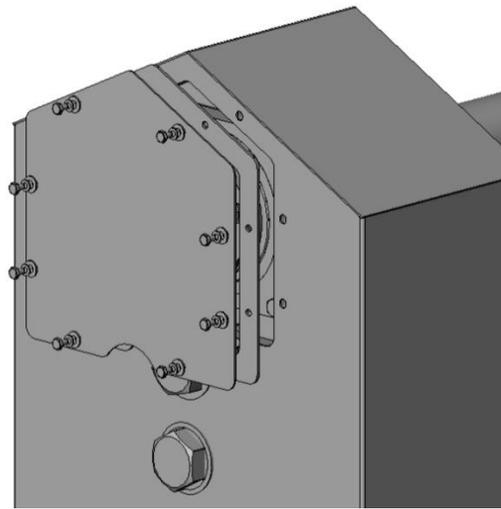
A13.1 Using 6 hex head screws, install the spindle lock rings. It may be necessary to align the flats on the spindle with the bolt pattern.

A13.2 Using food grade grease, apply grease to the thrust bearing through the fitting on the bearing retainer cap.

A13.3 Reinstall the cover and gasket.



**Step A13.1**



**Step A13.3**

**Step A14.** Follower final assembly.

A14.1 The follower has two lube points that need to be serviced prior to operating the press. These points are located under the covers on the pivot caps. Using a grease gun, fill the grease cavities on the follower until grease starts to come out around the retainer nut. Replace the covers.

A14.2 Install the dust catch trays at all 4 locations on the follower.

**Step A15.** Final assembly of the end support.

A15.1 Connect the AC power supply to the electric motor.

A15.2 Check the oil level in the hydraulic tank. The fill cap is fitted with a dip stick that will show the oil level in the tank. Ensure the level is within the marked acceptable range.

A15.3 Apply power to the electric motor. Check for any oil leaks. Cycle the open/close lever to the upper and lower positions. If the press operates correctly, replace the end support covers.

**Step A16.** The press is now fully assembled. Check the press for level and adjust the ball feet accordingly.

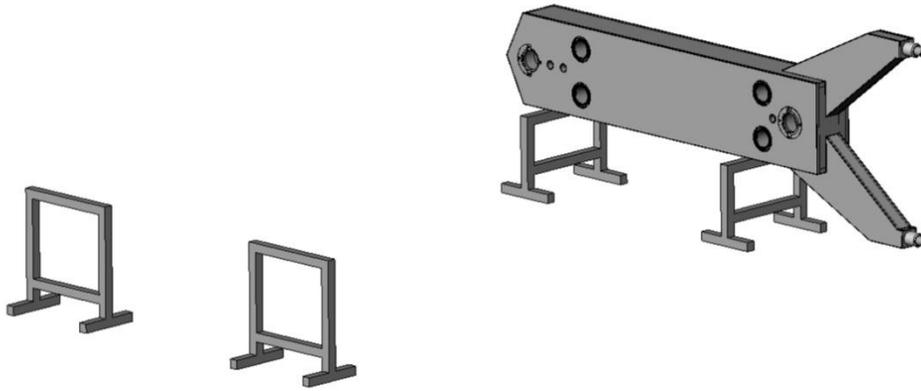
**Alternate Assembly Method:** (space permitting)

As with the disassembly, the assembly procedure can be simplified if adequate space is available. Assembling the press on its side while supporting it with jack stands can make the process easier and much faster. Frames size 7 and larger will require 2 forklifts to stand the frame once it's assembled. Smaller frames can be completely assembled and erected using just one forklift.

**Step AA1.** Position the fixed end and jack stands

AA1.1 Position the fixed end on its side on two jack stands. If you are using the stands provided by AGC Heat Transfer select the shorter pair.

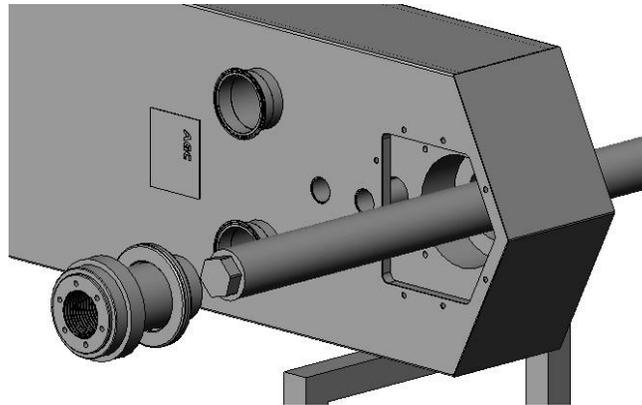
AA1.2 Position two slightly taller jack stands parallel to the fixed end approximately 12 feet from the fixed end and opposite from the port connections.



### Step AA1.1

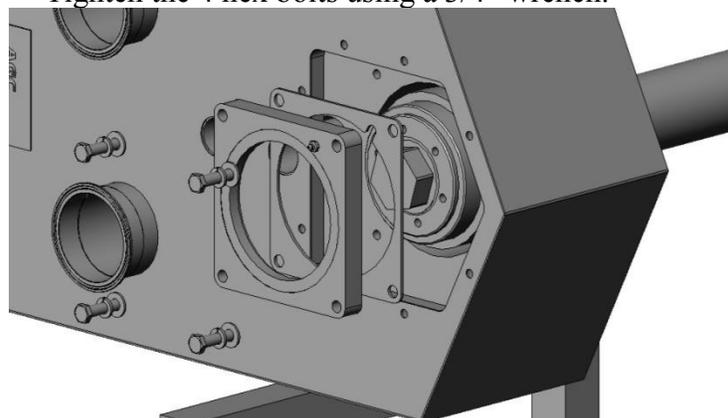
**Step AA2.** Install the upper spindle into the fixed end.

- AA2.1 Align one of the spindle shafts with the upper spindle opening in the fixed end. The shorter machined end should be inserted through the fixed end exposing approximately 12 inches of thread.
- AA2.2 Slide a thrust bearing with the tapered roller side toward the fixed end onto the spindle shaft.
- AA2.3 Install a spindle end nut onto the spindle. Turn the nut until the bottom of the hex is flush with the face of the nut.



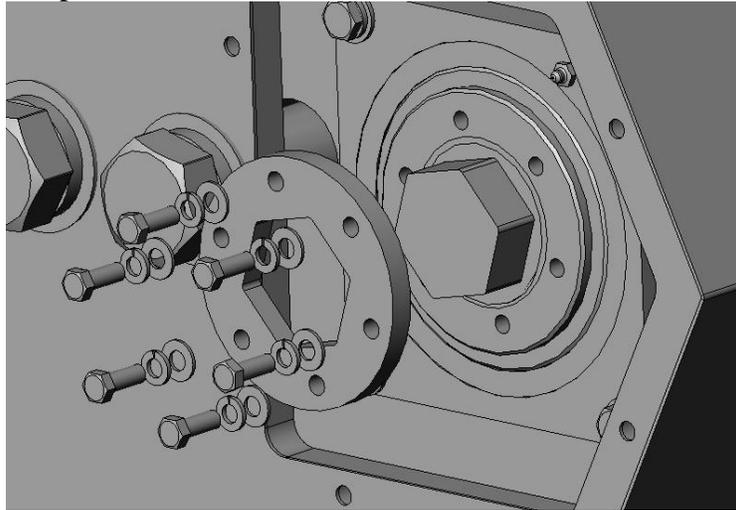
### Step AA2.3

- AA2.4 Slide the spindle assembly through the fixed end until the bearing is fully seated into the bore.
- AA2.5 Install the bearing retainer plate with gasket to secure the upper spindle. Tighten the 4 hex bolts using a 3/4" wrench.



### Step AA2.5

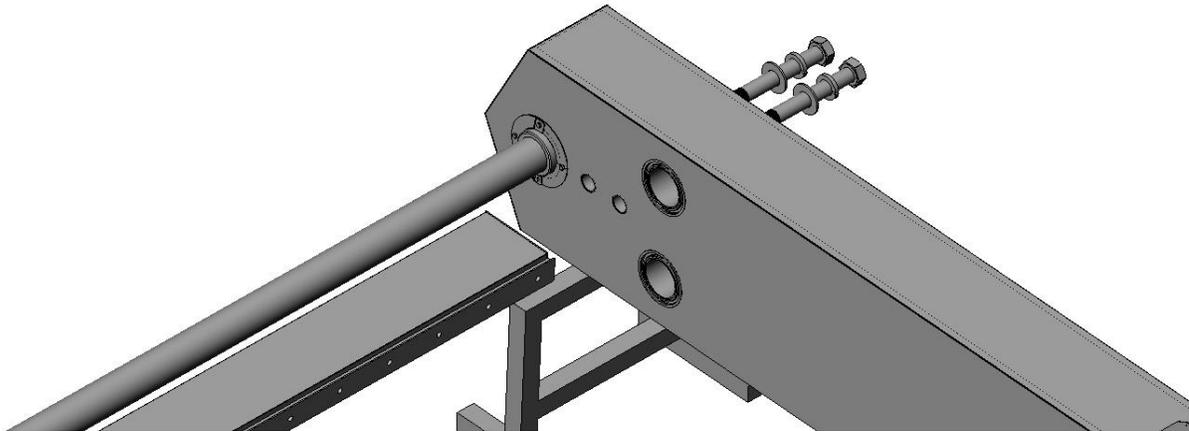
AA2.6 Install the spindle lock rings using 6 hex nuts with washers in each. It may be necessary to align the flats on the ring with the hex on the spindle shaft end.



**Step AA2.6**

**Step AA3.** Install the upper rail assembly.

AA3.1 Position the upper rail next to the fixed end. The rail hanger should be down and the flush end should be toward the fixed end.



**Step AA3.1**

AA3.2 Apply food grade anti seize to the rail bolts.

AA3.3 Slide the upper rail against the fixed end. Align the bolt holes with the threaded holes in the upper rail.

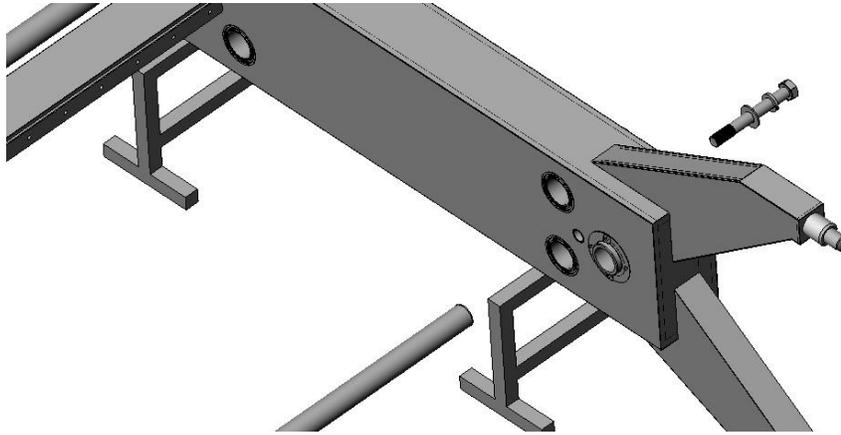
AA3.4 Using a 2-3/8" wrench, tighten the upper rail bolts securing the upper rail to the fixed end.

**Step AA4.** Install the lower rail assembly. The lower rail is held in place with a single bolt on the fixed end.

AA4.1 Apply food grade anti seize to the lower rail bolt.

AA4.2 Align the lower rail with the bolt hole in the fixed end.

AA4.3 Using a 2-3/8" wrench, install the lower rail to the fixed end with one rail bolt washer combination.

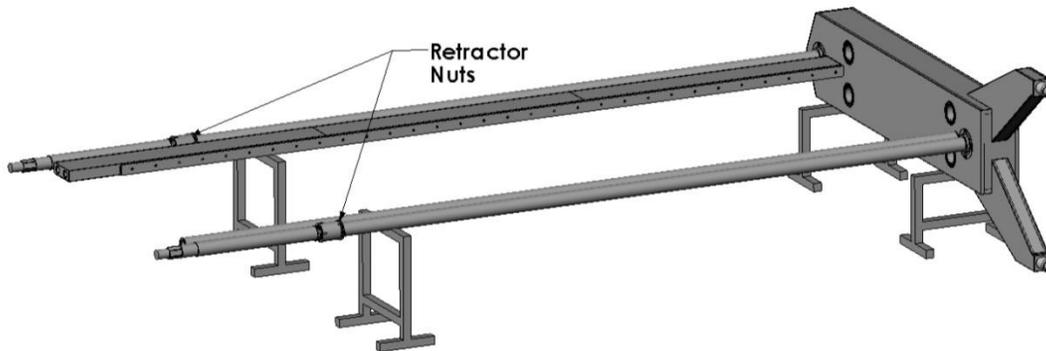


**Step AA4.3**

**Step AA5.** Install the lower spindle assembly. The lower spindle assembly procedure is identical to the upper spindle with the exception of location. Refer to section AA2 above for installation procedure.

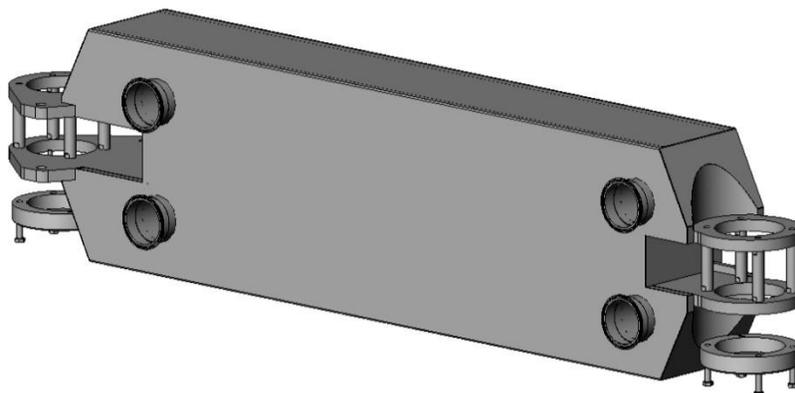
**Step AA6.** Install the follower assembly.

AA6.1 Install the follower retractor nuts onto the spindles. The nuts should be threaded onto the shaft at least 30 inches. The nuts are fitted with plastic thread cleaners. These plastic inserts face the fixed end.



**Step AA6.1**

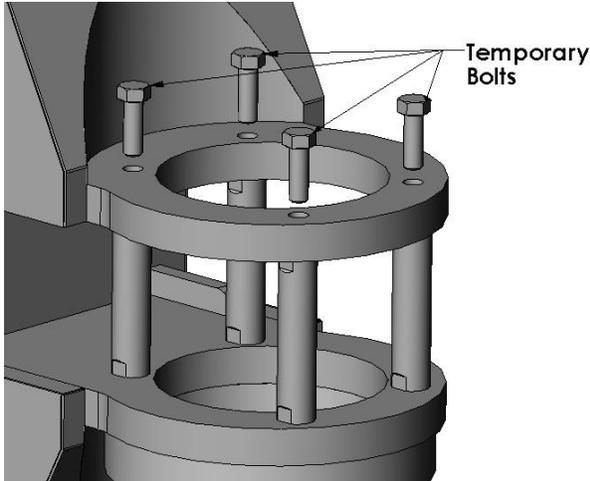
AA6.2 On the follower, temporarily install one pivot cap at each end. These caps will support the pivot nut until the follower is in place on the spindle shafts.



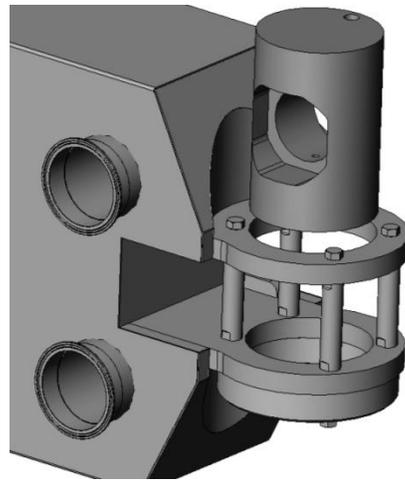
**Step AA6.2**

AA6.3 Install the pivot nuts at each end of the follower. Note: The nuts fit in a very close tolerance bore. If the follower tabs are not parallel the pivot nut may not assemble easily. If this is the case, temporarily align the follower tabs using the clamp bars with 1-1/2" long 1/2-13 bolts.

AA6.4 Install the pivot nuts aligning the square pocket with the port connection side of the follower. Also, make sure the grease fittings are pointing down.



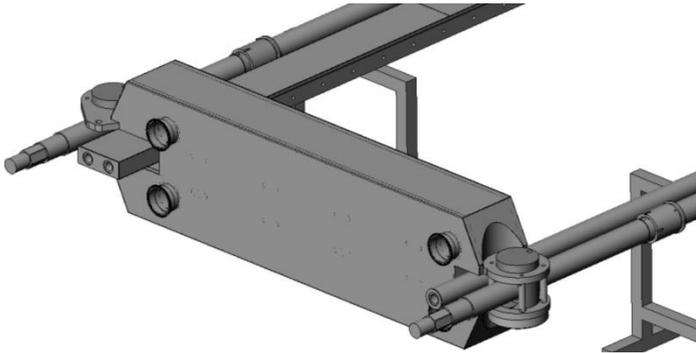
**Step AA6.3**



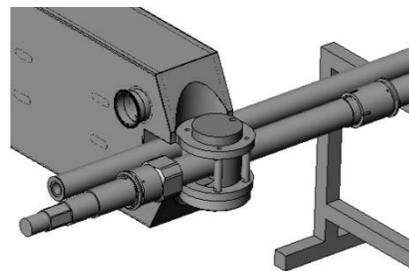
**Step AA6.4**

AA6.5 Using a forklift truck, carefully move the follower onto the spindles and rails. Move the follower in enough to expose approximately 12 inches of the threads.

AA6.6 Thread the follower drive nuts onto the upper and lower spindle shafts. The square boss on the nut should face the follower. The flats on the square nuts should also line up with the flats in the pivot nut socket.



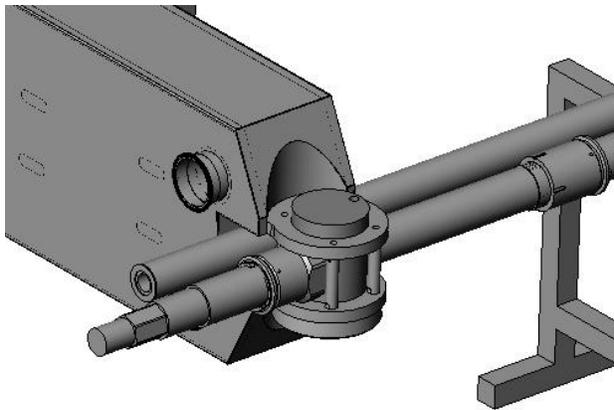
**Step AA6.5**



**Step AA6.6**

AA6.7 Measure the distance each drive nut threaded onto the spindle. It is important that these be equal in order for the press to close properly. Move the follower back so the drive nuts nest into the socket on the pivot nut.

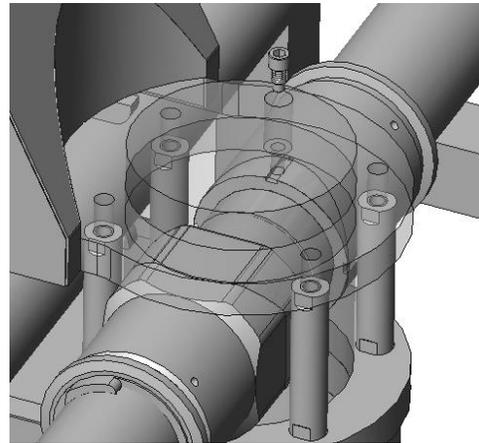
AA6.8 Turn the follower retainer nut counterclockwise until it is firmly seated into the socket on the pivot nut. The retainer nut is locked in place with dog point screws. The screws need to line up with one of the slots in the retainer nut. Turn the retainer nut clockwise just until a slot is lined up with the bolt hole. Once aligned insert a dog point screw to secure the retractor nut.



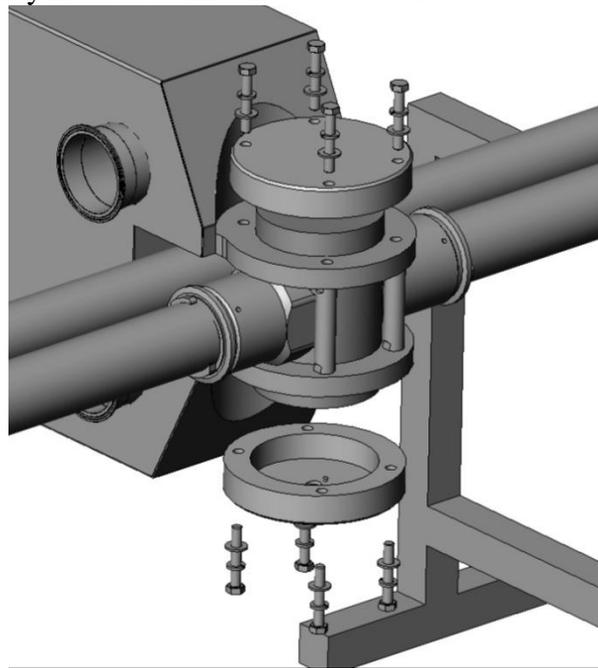
**Step AA6.7**

AA6.9 Remove the pivot cover installed in step AA6.2 above. Install a dog point screw into the socket on the pivot nut.

AA6.10 Install all 4 pivot caps. Two pivot caps are fitted with a 2 bolt cover. These covers provide access to the lube points on the pivot nut and they need to be installed on the same side as the grease fitting.



**Step AA6.8**



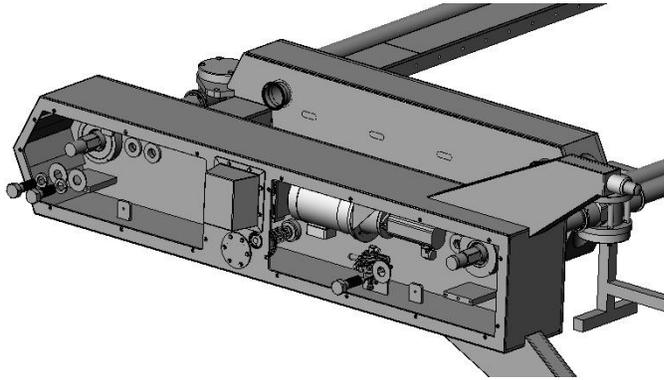
**Step AA6.10**

AA6.11 Install the follower rollers.

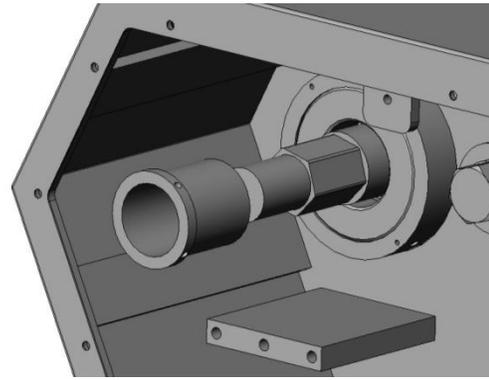
**Step AA7.** Install the end support assembly.

AA7.1 Carefully slide the end support over the spindles up to the top and bottom rails. Install the rail bolts with washers securing the end support in place.

AA7.2 Install the spindle bushings on the top and bottom spindles. The bushings should slide easily through the bearing in the end support. If the bushing is tight, the spindle might not be centered in the opening. Manipulate the spindle manually to center it in the opening. Once the bushing is fully seated, lock it in place using a 5/16 hex wrench.

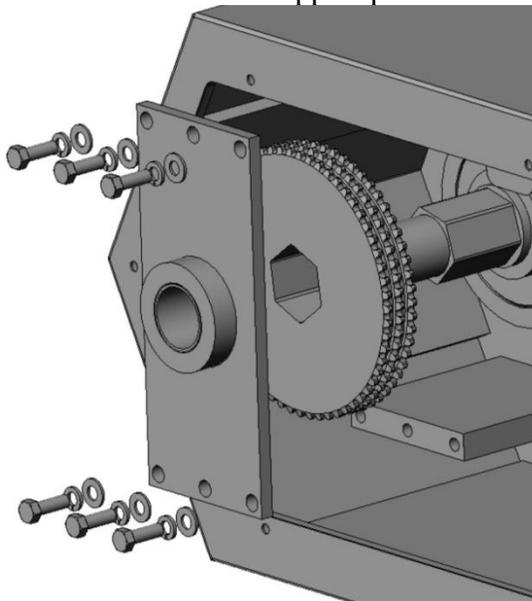


**Step AA7.1**

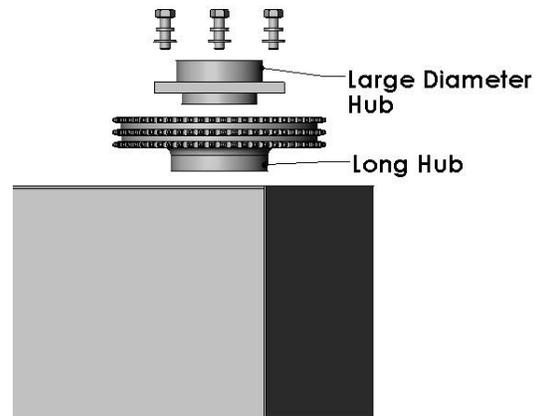


**Step AA7.2**

AA7.3 Install the upper sprocket and sprocket support plate. When installing the upper sprocket, the long hub points inward and the larger hub on the support plate should be on the outside of the plate.

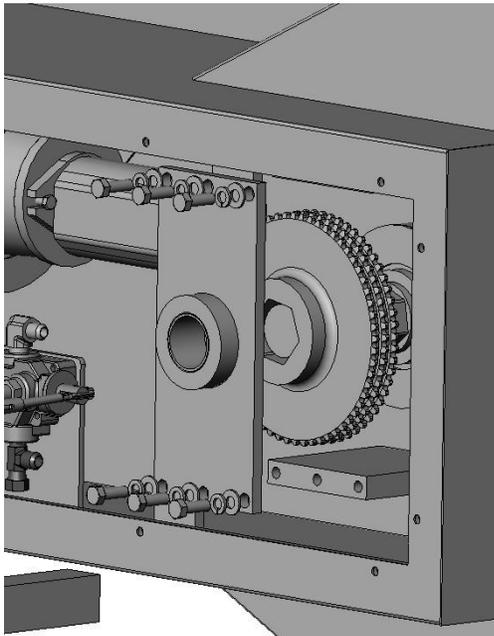


**Step AA7.3a**

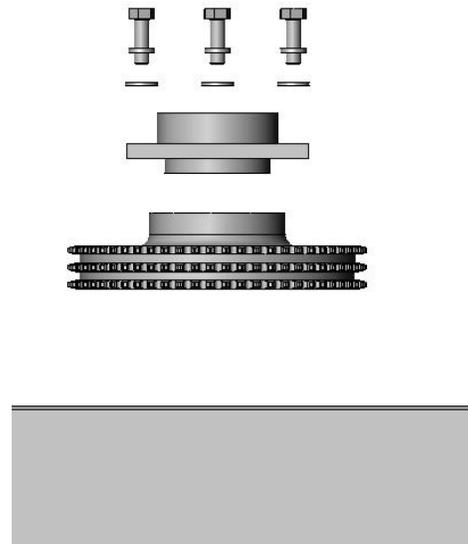


**Step AA7.3b**

AA7.4 Install the lower sprocket and sprocket support plate. The sprocket support plate will have the larger hub facing out as with the upper plate, but the sprocket will be reversed. The long hub will face out on the bottom sprocket.



**Step AA7.4a**



**Step AA7.4b**

**Step AA8.** Stand the press up. If your press is size 7 or larger two lifts are required to stand the unit up. Presses size 6 and smaller can be lifted with a single lifting device.

AA8.1 (Large Sizes) Position the lift trucks near each end of the top rail. Working together slowly lift the press by the top rail until the press is vertical.

AA8.2 (Small Sizes) Working near the center of the top rail, slowly lift the press by the top rail. Be mindful that the balance point will not be in the center of the rail.

AA8.3 Once the press is standing it can be leveled by adjusting the ball feet. When adjusting the press never exceed the maximum port height listed on the streaming diagram.

**Step AA9.** Install the end support hydraulic tank assembly.

AA9.1 Install the hydraulic tank assembly if it was removed during disassembly. The tank has a single hose connection. This hose is the return line coming from the filter. Connect the hose using a 7/8" wrench being careful to not over-tighten the hose.

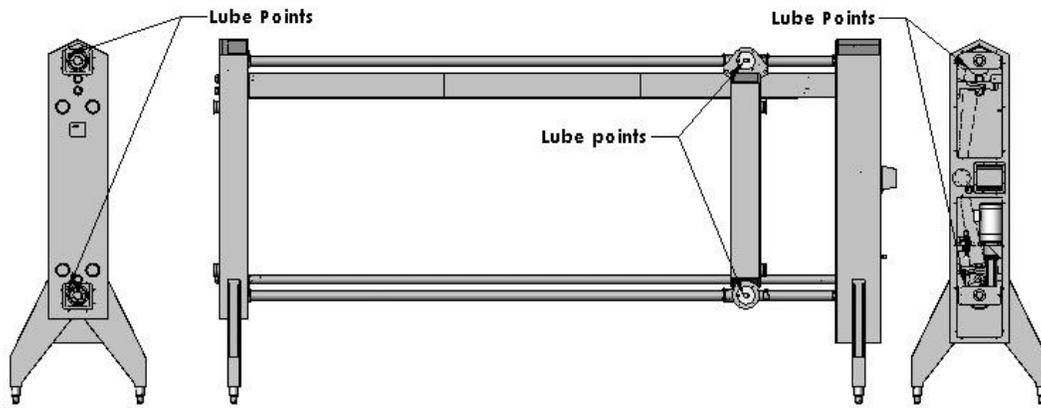
AA9.2 Install the suction pipe. The pipe slips into the tank through a tank flange fitting. The opposite end is threaded into a fitting on the pump. This connection will require thread sealing tape or compound.

AA9.3 Fill the tank with approximately 8 gallons of hydraulic oil through the fill neck. Note the fill cap is equipped with a dip stick. Ensure the oil is within the full range.

**Step AA10.** Install the end support drive chains and tensioners.

AA10.1 Sections A10 and A11 of this manual describe the proper installation procedure for installing the drive chains and tensioners. Refer to these sections for instructions.

**Step AA11.** Apply food grade grease to the 6 lube points on the press. The lube points are located on the fixed end (one at each bearing retainer), the follower (one at each pivot nut), and the final 2 in the end support (one at each spindle support).



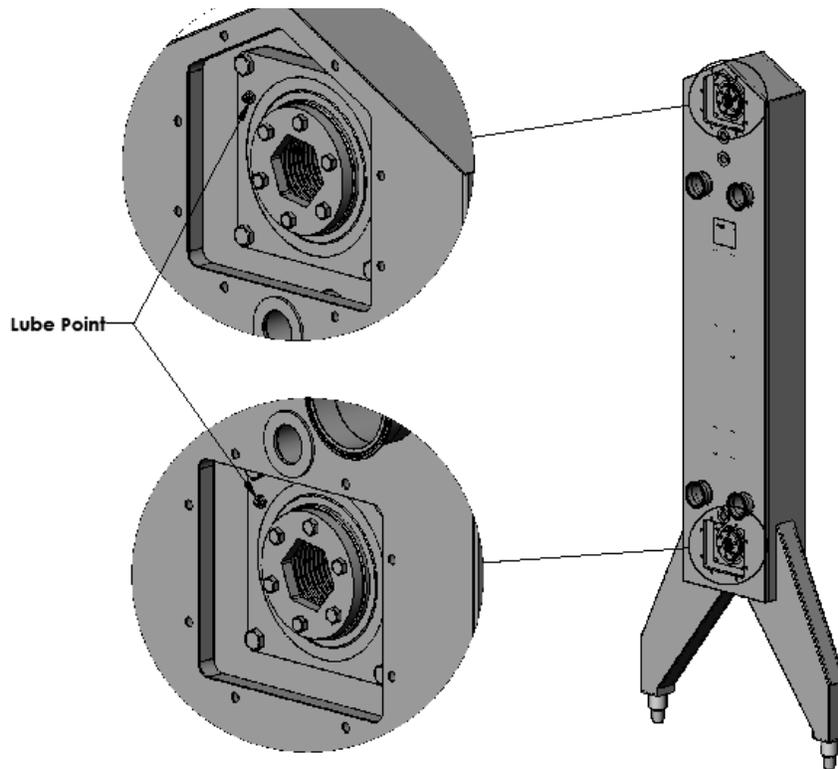
**Step AA12.** Connect the electric motor to an appropriate power source. With the control lever in the neutral (center) position, apply power to the unit. The pump will circulate hydraulic fluid through the system. Inspect the system for fluid leaks. If no leaks are detected move the control lever to the close (up) position. The sprockets should turn and the follower will move toward the fixed end. Move the control lever back to neutral then to the open (down) position. The sprockets should turn in the opposite direction and the follower will retract toward the end support. Move the lever back to the neutral position and inspect the press for any leaks or mechanical problems. If the press operates correctly, all covers and catch trays can be re-installed and the press can be put into service.

## **Operator Maintenance:**

The unit is designed to operate reliably with little operator maintenance. Keeping the press clean and well lubricated will ensure many years of trouble free operation. When performing routine maintenance follow all lockout/tagout regulations prescribed by your company. In addition, you should **NEVER OPEN THE PRESS WHEN IT IS PRESSURIZED OR WHEN IT IS HOT**. The press must be cooled below 90° F prior to opening.

A good preventative maintenance schedule will minimize or eliminate major mechanical problems. Operating the press regularly will also help to keep the mechanical components in good working order. The press has lube points on the fixed end, follower, and end support. Each lube point can be serviced with a standard grease gun. AGC Heat Transfer recommends that only high pressure food grade grease be used on the AR51-D Heat Exchanger.

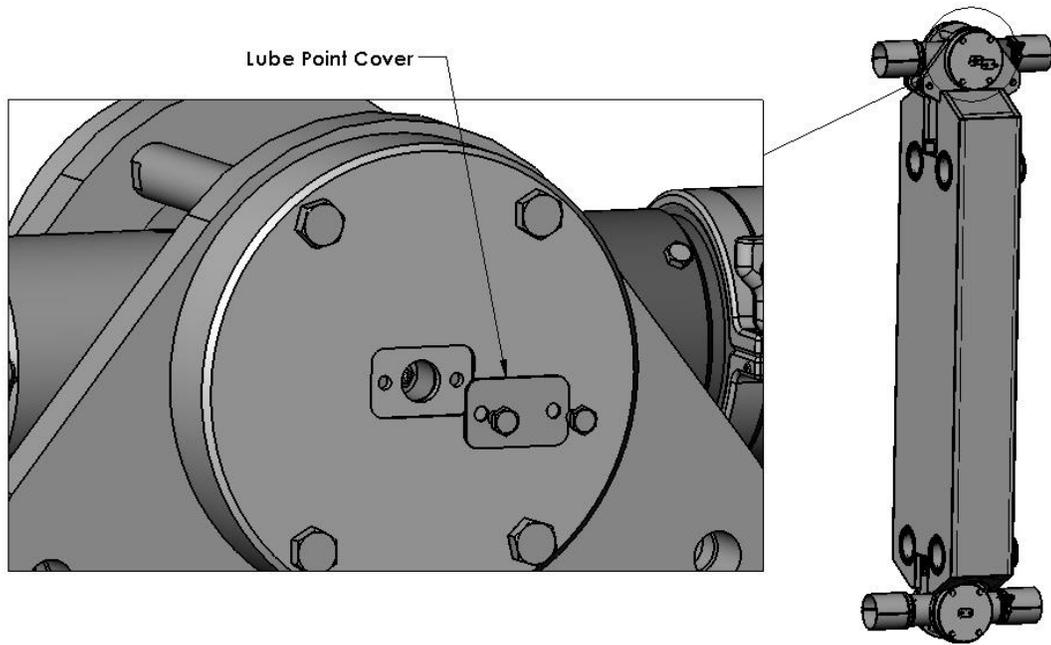
The fixed end lube points are accessible by removing the upper and lower covers. Each spindle screw retainer cover is equipped with one grease fitting as shown in figure 9.



**Figure 9**  
**Fixed End Lube Points**

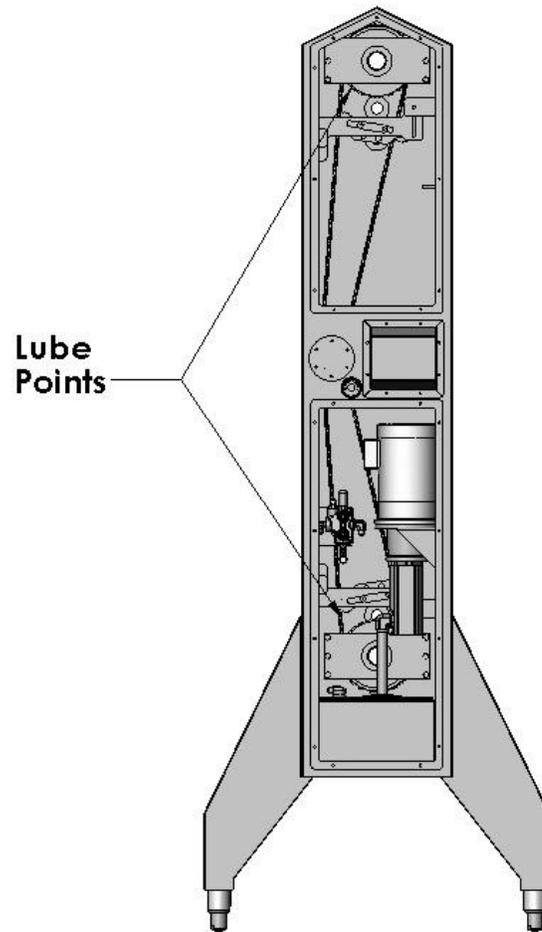
After removing the covers, use a standard grease gun to apply grease into the fitting. Since the cavity is sealed, only a small amount of grease should be required. Fill the cavity just until the seal starts to swell or until grease is seen.

The follower has two lube points. These are located on one side of the retainer caps as shown in figure 10. To access the grease fittings, remove the two cover screws and the cover. The grease reservoir on the follower ensures the spindle screws are continuously lubricated while in use. As the follower travels along the spindle shaft grease is being applied to the threaded shaft. Special thread cleaners ensure the majority of the grease stays in the grease reservoir. Since some grease remains on the spindle screws, the grease cavities on the follower will use more grease than the fixed end or end support. When applying grease to the follower fill the cavity just until seepage is detected around the bronze retractor nut.



**Figure 10**

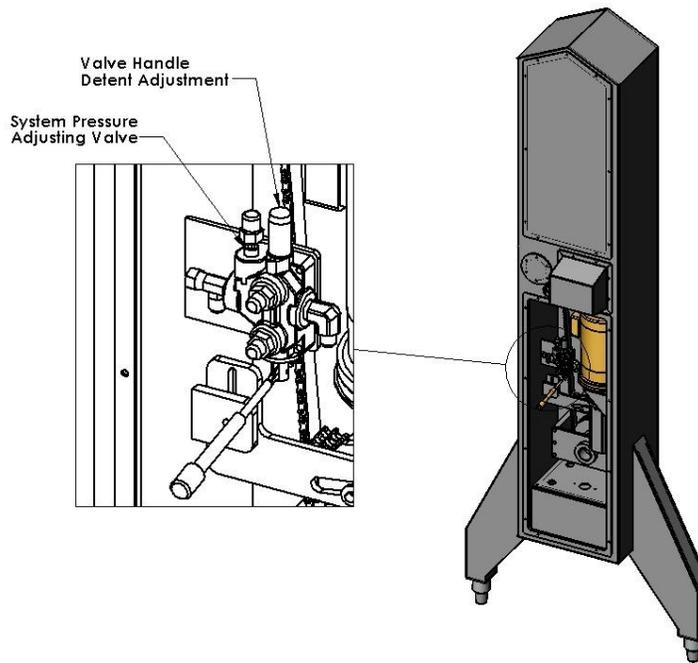
The end support has two lube points. These are located as shown in figure 11. As with the fixed end, the end support grease cavities are sealed and should only require a small amount of grease after being in service. When lubricating the end support, it is recommended to inspect the drive chains and other mechanical components. The drive chains may stretch with usage and could require an adjustment of the chain tensioners. The chain should have no more than 3/8" deflection when pressed near the center line between the sprocket drive shaft and the 60 tooth sprocket. If excessive deflection is observed, adjust the chain tensioner by loosening the two hex bolts and moving the tensioner closer to the 60 tooth sprocket.



**Figure 11**

**Hydraulic System:**

The hydraulic system is self contained and should require little operator maintenance. The oil should be checked regularly and changed after approximately 4000 hours of use. When changing the oil, use only good quality foam inhibited hydraulic oil (Grade 46). Use of lesser grade oils could lead to mechanical malfunctions within the hydraulic power system.

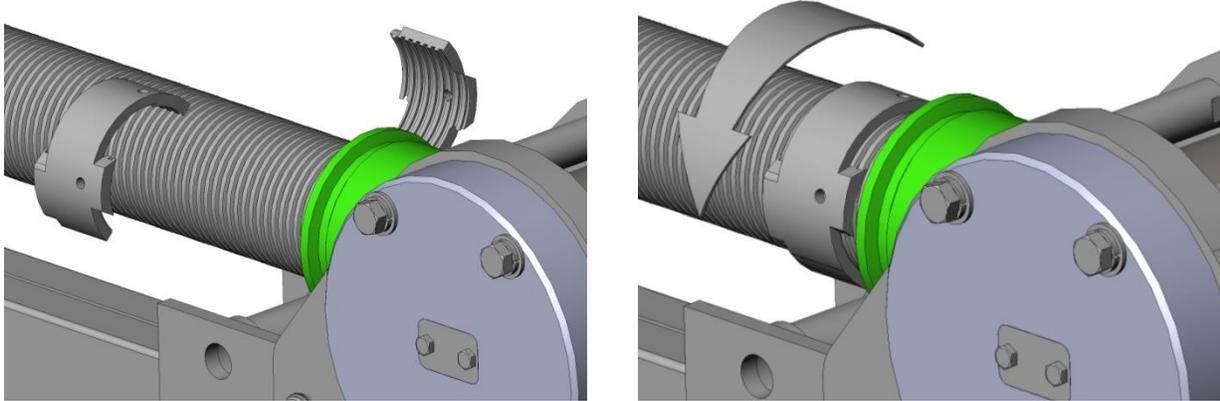


**Figure 12**  
**System Pressure Adjustment**

To access the adjusting screw, remove the cap as shown in figure 12. Note: This cap is fitted with an o-ring seal, and hydraulic fluid will seep around the adjusting screw during the adjustment. Turning the screw clockwise increases the system pressure. As a point of reference, a ¼ turn on the adjusting screw will increase system pressure by as much as 250 psi. Adjust the system pressure in small increments. A new AR51-D with new Pro5 stainless steel plates requires approximately 2300 psi to close to the “dead-hard” condition. When adjusting the system pressure, monitor the compressed dimension and note the pressure indicated on the pressure gauge. The minimum dimension shown on the streaming diagram will not normally be exceeded. After the pressure is set to the required level, replace the adjusting screw cap and operate the hydraulic system inspecting for system leaks. If no leaks are detected, replace the cover panel and return the press to normal operation.

**Follower Thread Cleaning Inserts:**

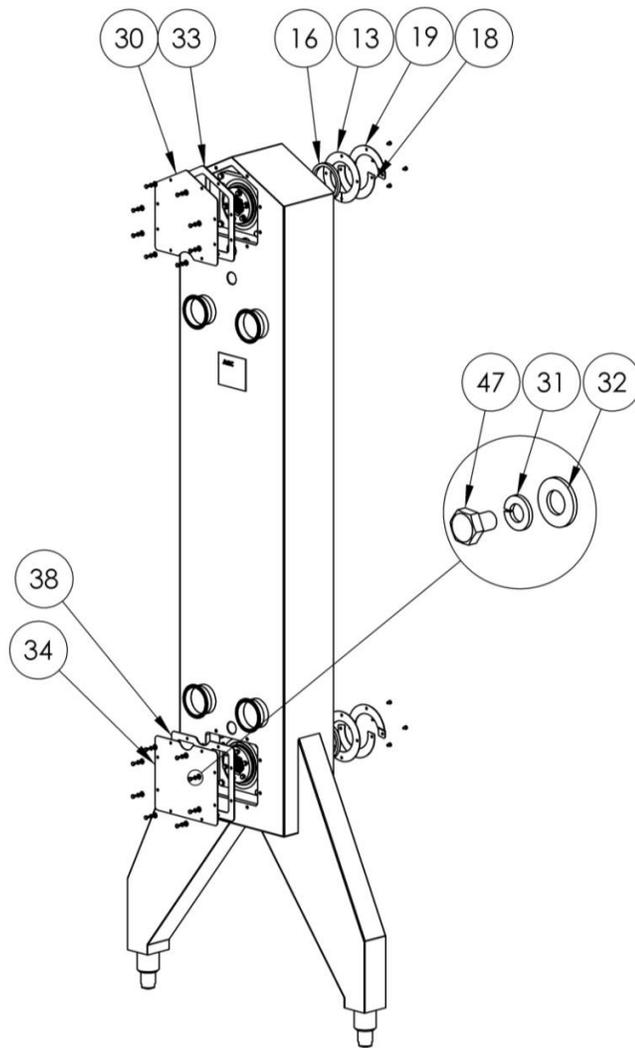
The follower is equipped with thread cleaning inserts. These inserts are designed to perform two functions. The first function is to prevent dirt and debris from entering the drive nuts. The second function is to ensure the lubricant is kept inside the threads where it is needed and only a minimal amount is left on the exposed screw. These cleaning inserts are made from a food grade plastic material and are considered wear parts. They are sold in matched sets and must be replaced in pairs. To replace a cleaning insert, remove the two screws from the bronze drive or guide nut. Turn the thread cleaner on the spindle shaft to remove it from the nut. Once free of the nut the worn cleaner can be discarded. The new cleaner is installed by placing the halves together around the spindle (note the orientation of the cleaner in figure 13) then turning the halves together into the bronze nut. Thread the cleaner into the nut until the locking holes are visible through the threaded screw hole on the bronze nut. Secure the cleaner with 1/4-28 x 1/2” screws and washers



**Figure 13**

**Parts List:**

Replacement parts for the Model AR51-D can be ordered from AGC or your local AGC distributor. Most parts are in stock and can be shipped within 24 hours from time of order. Some components have had engineering revisions, so when ordering spare parts be sure to have your unit specific information available.

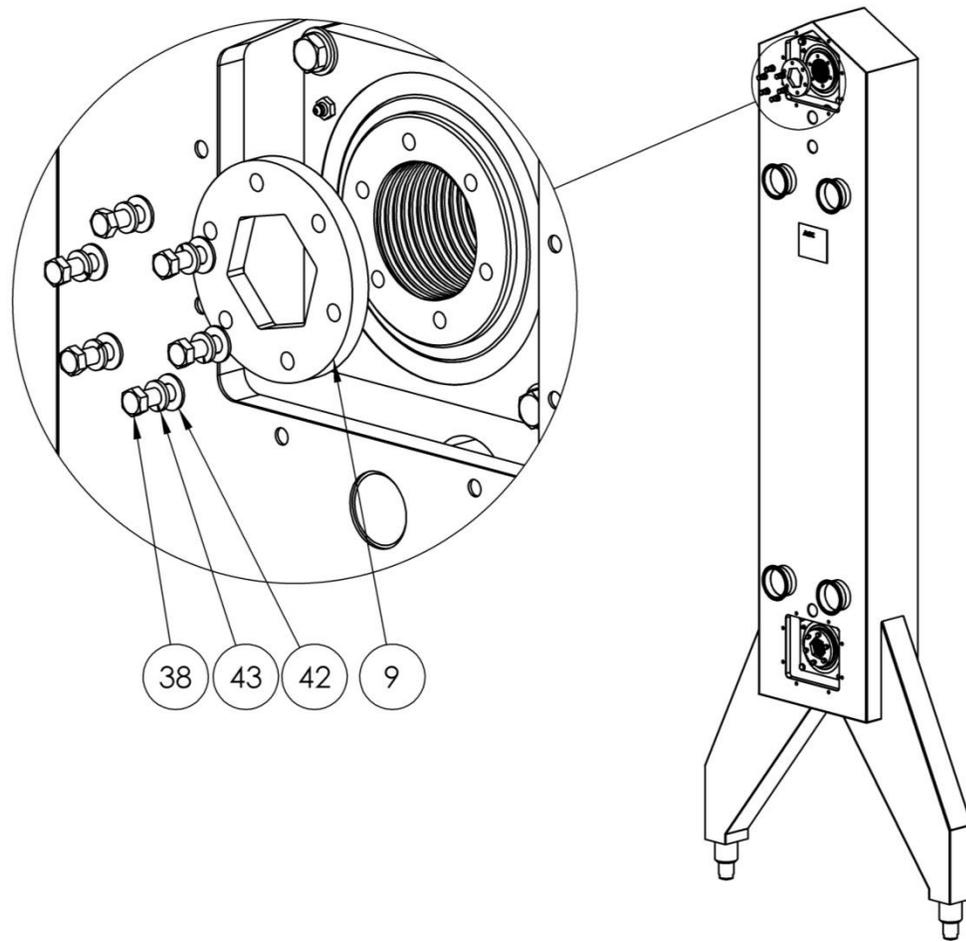


Note: Items 31, 32, and 47 are common to all covers on the AR51-D.

Item	Name	Part Number	Quantity Per Frame
12	AR51-D Fixed End Grease Seal	11014322	2
13	AR51-D Fixed End Trim Ring Gasket	11014323	2
16	Double Lip Seal	30000145	2
18	AR51-D Fixed End Trim Ring Half	11014325	2
19	AR51-D Offset Trim Ring Half	11014326	2
30	AR51-D Fixed End Top Cover	11014334	1
31	Lock Washer 1/4" SS	DL014	24
32	Flat Washer 1/4" SS	30000122	24
33	AR51-D Fixed End Top Cover Gasket	11014336	1
34	AR51-D Fixed End Bottom Cover	11014335	1
38	AR51-D Fixed End Bottom Cover Gasket	11014337	1
47	Hex Head Cap Screw 1/4-20 x 3/4	DH014C0034	24

**Figure 14**

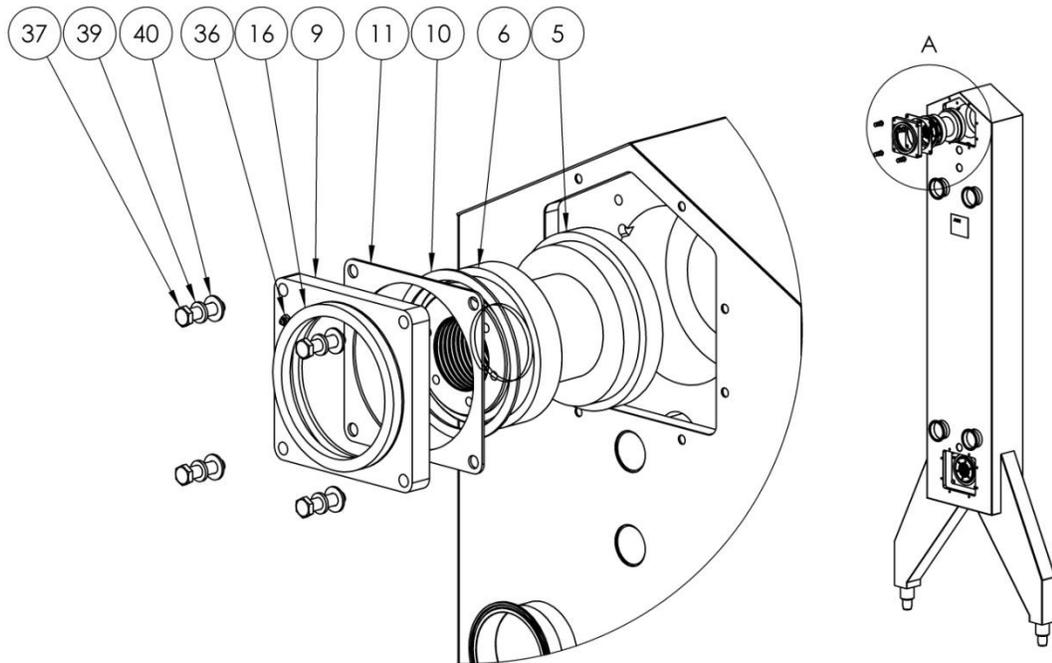
**AR51-D Fixed End Covers**



Item	Name	Part Number	Quantity Per Frame
9	AR51-D Fixed End Spindle Ring Retainer	11014345	2
38	Hex Head Cap Screw 3/8-16 x 1-1/2	11110756	12
42	Flat Washer 3/8" SS	DF038	12
43	Lock Washer 3/8" SS	11110782	12

**Figure 15**

**AR51-D Fixed End Spindle Lock**

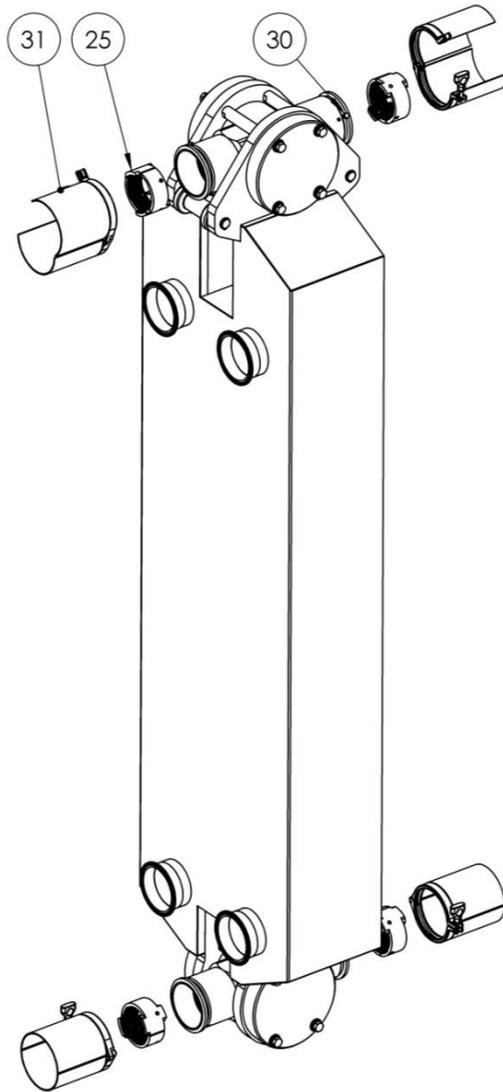


Note: Upper and Lower Spindles use identical bearing/retainer assemblies.

Item	Name	Part Number	Quantity Per Frame
5	Spherical Roller Thrust Bearing	30000180	2
6	AR51-D Fixed End Spindle Ring	11014316	2
9	AR51-D Fixed End Nut Retainer	11014320	2
10	AR51-D Spindle Retainer Bushing	11014321	2
11	AR51-D Fixed End Grease Seal	11014322	2
16	Double Lip Shaft Seal	30000143	2
36	Grease Fitting 1/8"NPT Straight	11014051	2
37	Hex Head Cap Screw 1/2-13 x 3/4	11110754	4
39	Lock Washer 1/2" SS	DL012	4
40	Flat Washer 1/2" SS	DF012	4

**Figure 16**

**AR51-D Fixed End Spindle Bearing and Retainer**

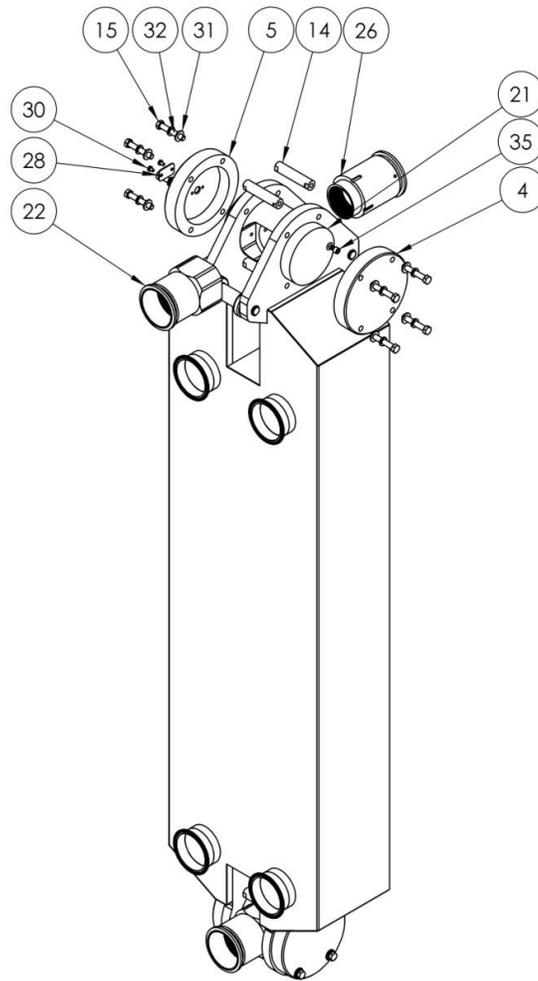


Note: Upper and lower spindle thread cleaners use identical components.

Item	Name	Part Number	Quantity Per Frame
25	AR51-D Spindle Screw Cleaner	11014234	4
30	Hex Head Cap Screw 1/4-28 x 1/2	30000113	8
31	AR51-D Spindle Dust Cover	11014028	4

**Figure 17**

**AR51-D Follower Spindle Thread Cleaner with Catch Tray**

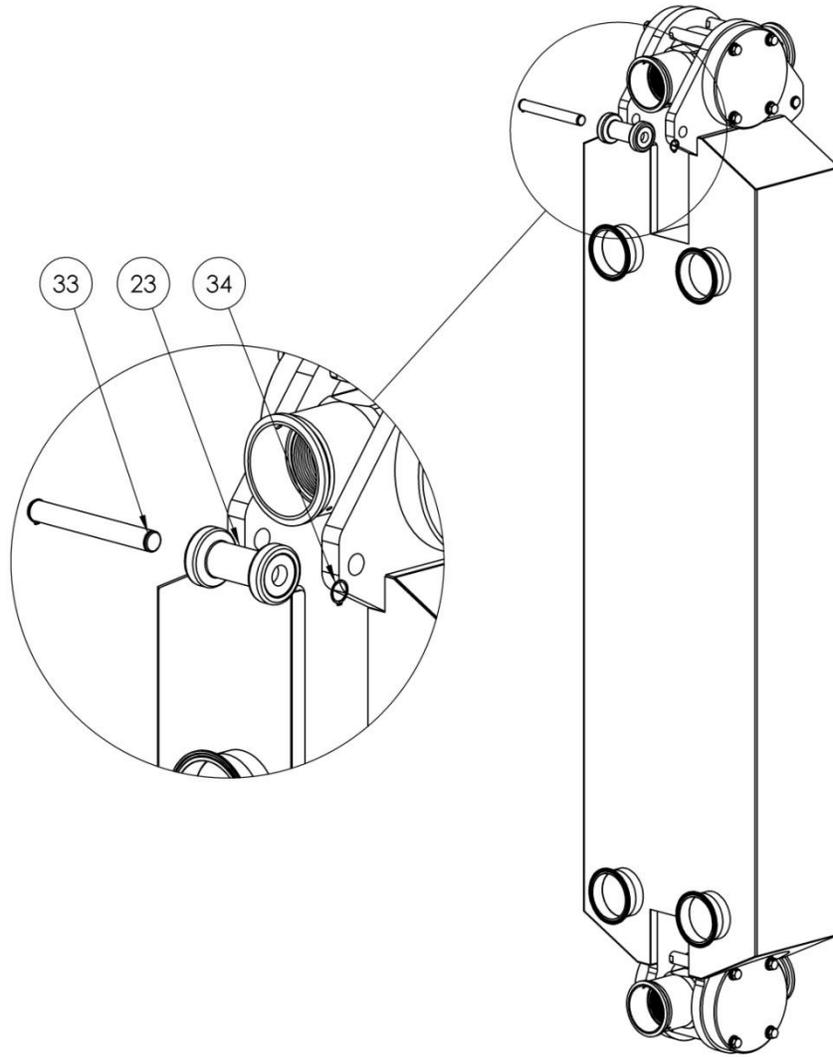


Note: Upper and Lower drive nuts and associated components are interchangeable.

Item	Name	Part Number	Quantity Per Frame
4	AR51-D Follower Pivot Cap	11014261	2
5	AR51-D Follower Pivot Cap with Cover	11014261	2
14	AR51-D Follower Clamp Bar	11014214	8
15	Hex Head Cap Screw 1/2-13 x 3-1/2	30000112	16
21	AR51-D Spindle Nut Socket	11014225	2
22	AR51-D Spindle Nut	11014715	2
26	AR51-D Spindle Guide Nut	11014716	2
28	AR51-D Follower Lube Cover	11014233	2
30	Hex Head Cap Screw 1/4-28 x 3/8	30000125	4
31	Flat Washer 1/2" SS	DF012	16
32	Lock Washer 1/2" SS	DL012	16
35	Socket Head Cap Screw w/ Dog Point	11021712	4

**Figure 18**

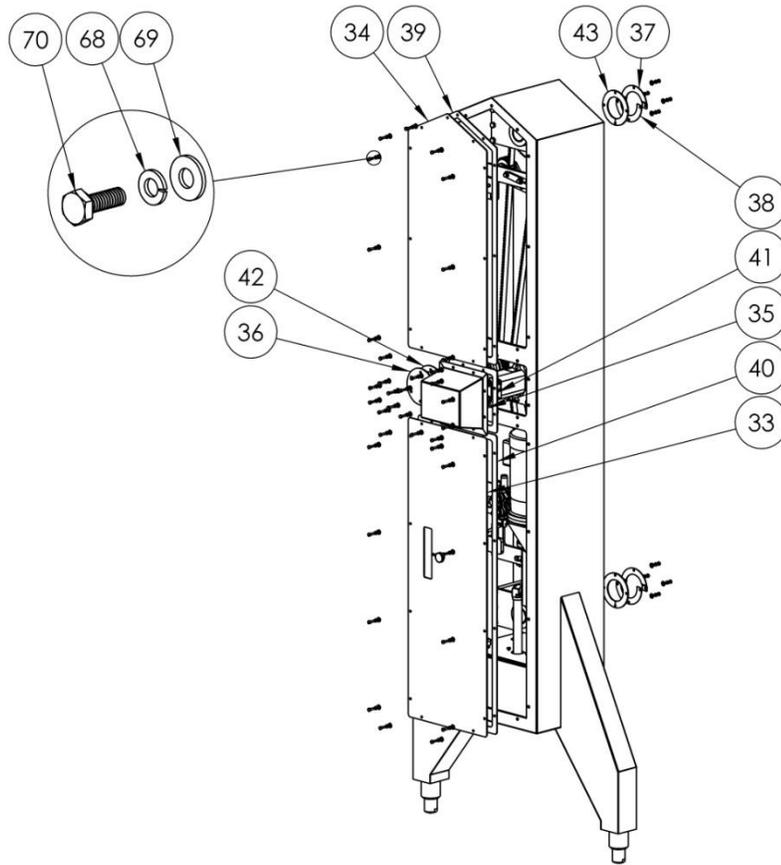
**AR51-D Follower Drive Nut Assembly**



Item	Name	Part Number	Quantity Per Frame
23	AR51-D Follower Roller Assembly	11014242	2
33	AR51-D Follower Roller Pin	11014240	2
34	Snap Ring	87H	4

**Figure 19**

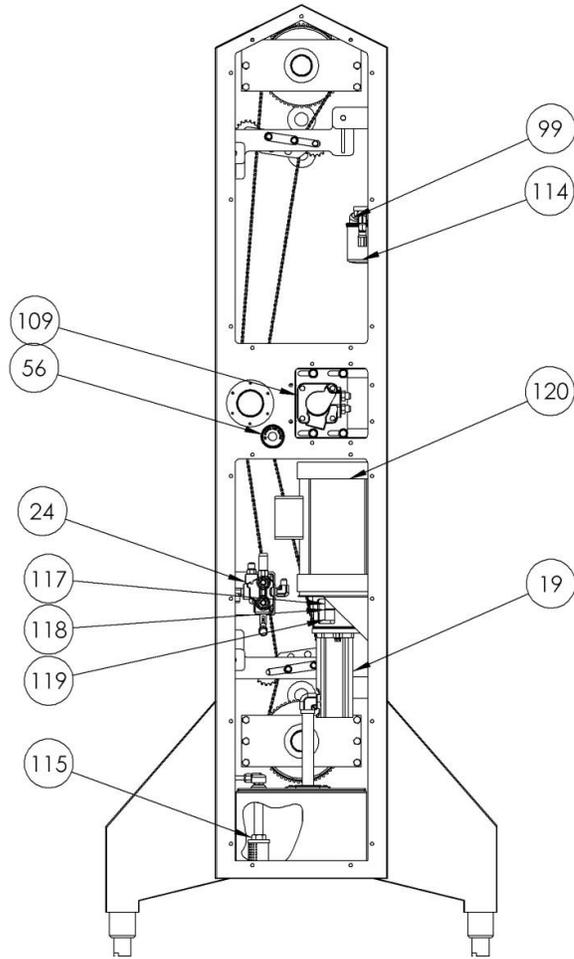
**AR51-D Follower Roller Assembly**



Item	Name	Part Number	Quantity Per Frame
33	AR51-D End Support Bottom Cover	11014128	1
34	AR51-D End Support Upper Cover	11014135	1
35	AR51-D Raised Motor Cover	11014136	1
36	AR51-D Sprocket Retainer	11014137	1
37	AR51-D End Support Offset Ring	11014148	2
38	AR51-D End Support Spindle Cover	11014149	2
39	AR51-D End Support Upper Cover Gasket	11014140	1
40	AR51-D End Support Bottom Cover Gasket	11014141	1
41	AR51-D Motor Cover Gasket	11014142	1
42	AR51-D Sprocket Retainer Gasket	11014143	1
43	AR51-D End Support Spindle Gasket	11014144	2
68	Lock Washer 1/4" SS	DL014	45
69	Flat Washer 1/4" SS	30000122	45
70	Hex Head Cap Screw 1/4-20 x 3/4	DH014C0034	45

**Figure 20**

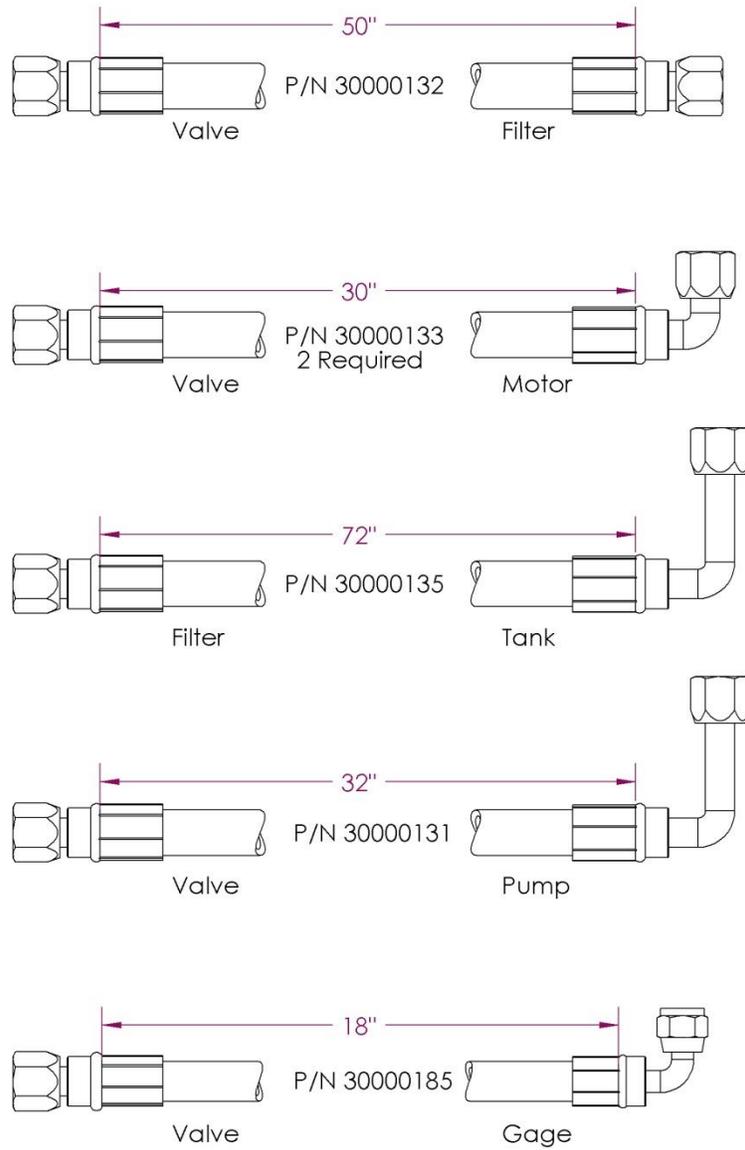
**AR51-D End Support Covers and Gaskets**



Item	Name	Part Number	Quantity Per Frame
19	Prince Hi-Lo Pump	30000137	1
24	Double Detent Hydraulic Valve	LS755T4JRHHA	1
56	Pressure Gage	9692245+132745	1
99	Oil Filter Mount	ZAF-07-25-0	1
109	Hydraulic Motor	30000186	1
114	Oil Filter	AE-10	1
115	AR51-D Oil Return Diffuser	30000167	1
117	Motor Coupling Half	30000165	1
118	Coupling Insert	M270	1
119	Pump Coupling Half	30000139	1
120	NEMA 213T Motor 10 HP	140484	1

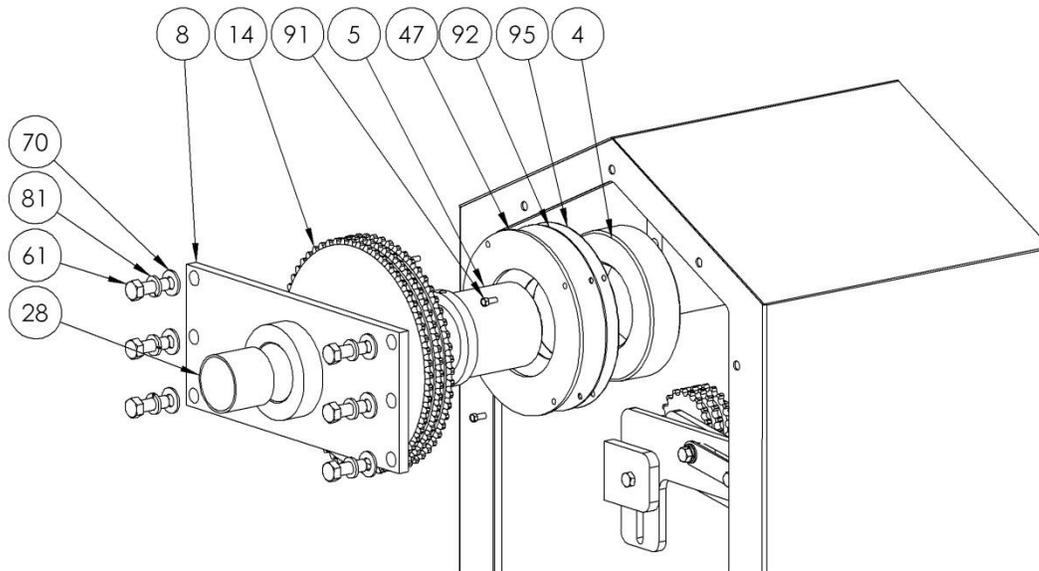
**Figure 21**

**AR51-D End Support Hydraulic Components**



**Figure 22**

**AR51-D Hydraulic Hoses**

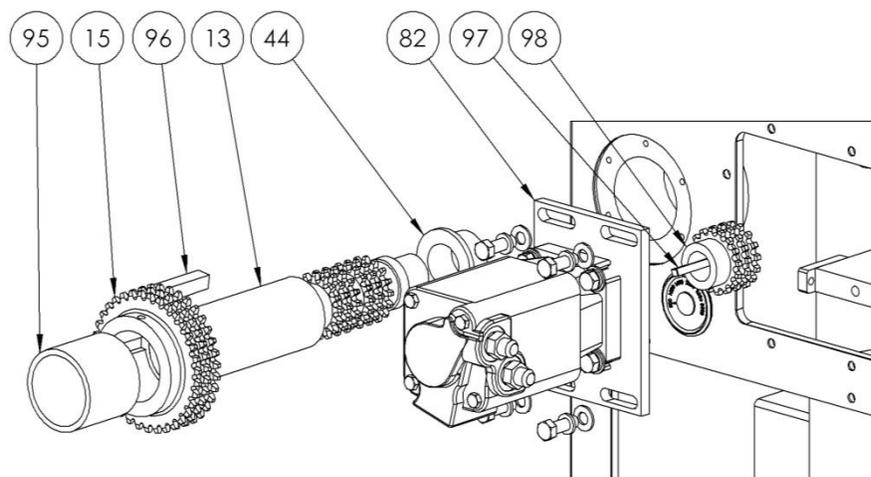


Note: Upper and Lower Sprocket Drive components are interchangeable.

Item	Name	Part Number	Quantity Per Frame
4	Self Aligning Roller Bearing	30000146	2
5	AR51-D Spindle Shaft Bushing	11014105	2
8	AR51-D Spindle Support Assembly	11014146	2
14	60 Tooth Sprocket	11014155	2
28	Spindle Bearing	30000203	2
47	AR51-D End Support Bearing Retainer	11014158	2
61	Hex Head Cap Screw 1/2-13 x 1-1/2	11110774	12
70	Flat Washer 1/2" SS	DF012	12
81	Lock Washer 1/2" SS	DL012	12
91	Hex Head Screw 12-24 x 5/8	30000153	8
92	AR51-D End Support Bearing Grease Seal	11014171	2
95	AR51-D End Support Bearing Grease Shield	11014172	2

**Figure 23**

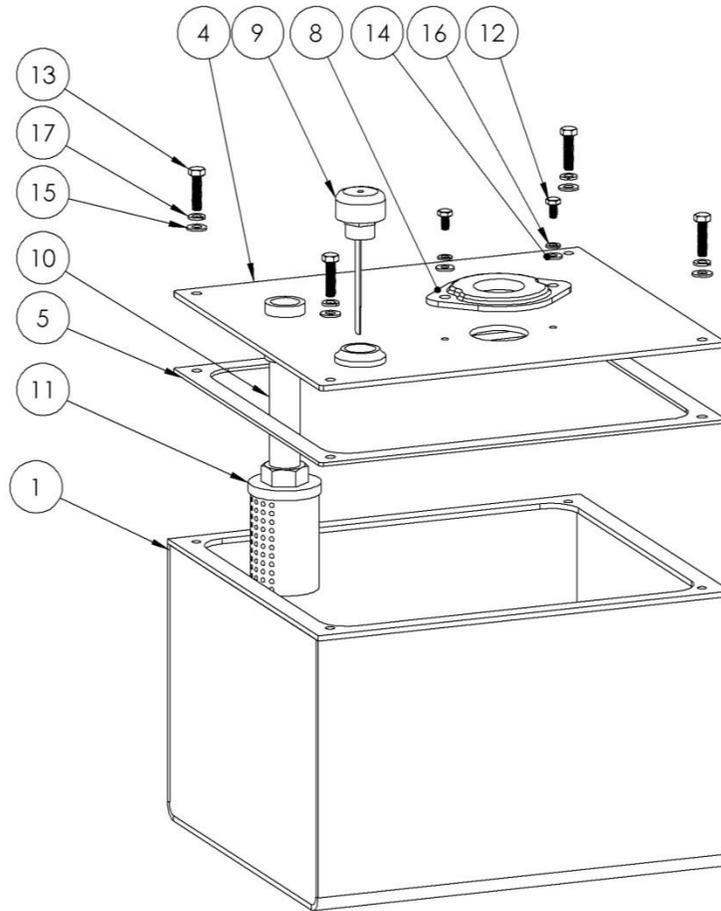
**AR51-D End Support Sprocket Drive Mechanism**



Item	Name	Part Number	Quantity Per Frame
13	AR51-D Sprocket Drive Shaft	11014115	1
15	36 Tooth Sprocket	11001501	1
44	AR51-D Sprocket Shaft Flange Bearing	30000149	1
82	AR51-D Motor Mount	11014182	1
95	AR51-D Sprocket Shaft Bushing	30000160	1
96	AR51-D Sprocket Shaft Key	11014033	1
97	AR51-D Hydraulic Motor Shaft Key	11014034	1
98	AR51-D Hydraulic Motor Sprocket	30000187	1

**Figure 24**

**AR51-D End Support Drive Components**



Item	Name	Part Number	Quantity Per Frame
1	AR51-D Hydraulic Tank	11014163	1
4	AR51-D Hydraulic Tank Lid	11014168	1
5	AR51-D Hydraulic Tank Lid Gasket	11014169	1
8	AR51-D Suction Flange	30000127	1
9	Oil Filler Cap with Dip Stick	11110486	1
10	Diffuser Nipple	30000151	1
11	AR51-D Oil Return Diffuser	30000167	1
12	Hex Head Cap Screw 1/4-20 x 1 SS	11110757	2
13	Hex Head Cap Screw 5/16-18 x 1-1/4 SS	11110763	4
14	Flat Washer 1/4" SS	DF014	2
15	Flat Washer 5/16" SS	11110760	4
16	Lock Washer 1/4" SS	DL014	2
17	Lock Washer 5/16" SS	11110761	4

**Figure 25**

**AR51-D Hydraulic Tank Assembly**

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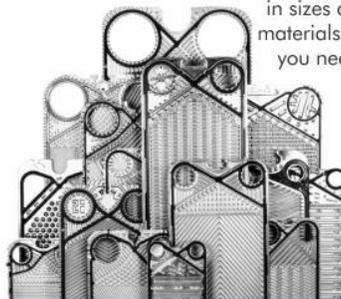
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